Instruction manual

VWR® P6 Spectrophotometer

EU cat. no 634-1173

Version 01 Issue 05/2023

Legal address of Manufacturer

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Safety Information

Avoiding Electrical Shock

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

VWR recommends against the use of P6 Spectrophotometer.

To avoid electrical shock

- 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 your local VWR office and authorized contractual partners.
- The device must be connected to a power outlet that has a protective ground connection.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Avoiding Damage to the Instrument

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

Package Contents

Description	Quantity
Spectrophotometer	1PC
Glass Cuvette	4PCS
Quartz Cuvette	2PCS
Power Cord (Euro/UK/CH Plug)	3PCS
Software USB Drive	1PC
USB Cable	1PC
Quick Manual	1PC
Dust Cover	1PC
Fuse	1PC
Tablet PC (With Power Adapter, Euro Plug)	1PC

Unpacking

Open the package, according to carefully check the packaging packing list items, if found inside the packaging are missing or damaged items please contact your local VWR/Avantor service provider or something similar.

Installation

Placement

Place the instrument on the stable table carefully.

Connect the power cord

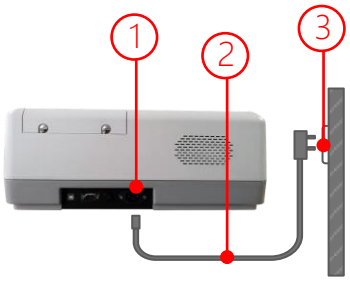
Check to confirm instrument power switch is turned off, the power cord plug into two separate power interface and power supply socket apparatus.

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.



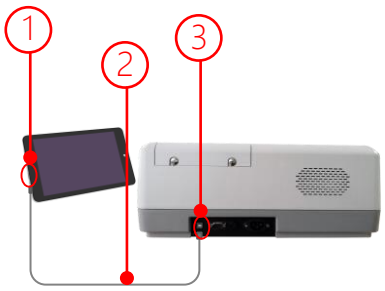
1 – Power inlet	2 – Power cord
3 – Power outlet	

Connect to Tablet with Bluetooth

Make sure that "Bluetooth" is turned on the tablet, and the user will need to start the spectrum analysis software to connect automatically.

Connect to Tablet with USB Cable

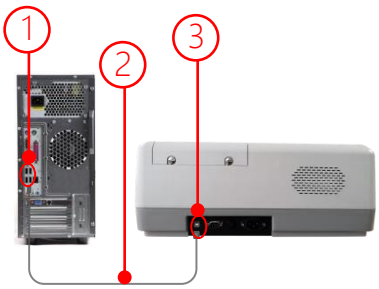
Plug one end of the USB cable into the instrument's USB port (Type B, square) and the other end into the tablet PC's USB port (Type A, flat. If the tablet PC only has type C USB port, please use a type C to A adapter.).



1 – USB port of tablet (Type A, flat)	2 – USB Cable
3 –USB port of instrument (Type B, square)	

Connect to computer with USB Cable

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).



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

Intended use

For research use only. Not intended for any animal or human therapeutic or diagnostic use.

Symbols and conventions

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

⚠	**CAUTION** This symbol indicates a potential risk and alerts you to proceed with caution

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

Product Specifications

Optical System	Split Beam
Wavelength Range	190-1100nm
Band Width	1.5nm
Stray Light	≤0.05%T @ 220nm & 360nm
Photometric Range	0 to 200%T, -0.3 to 3.0A, 0 to 9999C
Wavelength Accuracy	±0.5nm
Photometric Accuracy	±0.3%T or ±0.004A @ 1A
Stability	0.0005A/h @ 500nm(After warming up for 1 hour)
Baseline Flatness	±0.001A
Language	English, French, German, Spanish, Portuguese, Chinese
Display	TFT Color LCD (10.5", Touch Screen)
Storage	64GB
Interface	USB-C, WIFI, Bluetooth, HDMI
Measuring Procedure	Photometry, Multi Wavelength, Kinetics, Time Scanning, Quantitation, Spectrum Scanning, Biological Method
Power Supply	AC 100~240 V, 50~60 Hz, 120 W
Dimension	456×360×185
Weight	11kg
Work Environment	15 to 35℃, 15 to 70% relative humidity
Store Environment	-10 to 50℃, 15 to 70% relative humidity

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

Overview

P6 Spectrophotometer used in Chemistry, Pharmaceuticals, Biochemical, Metallurgy, Light Industry, Textile, Material, Environments, Medical, Education and some other fields for Quality Control laboratories.

Getting Started

The following chart describes the basic operation of the instrument.

Turn the instrument power on/off

Press the blue button on the right of the instrument to start/shut down.

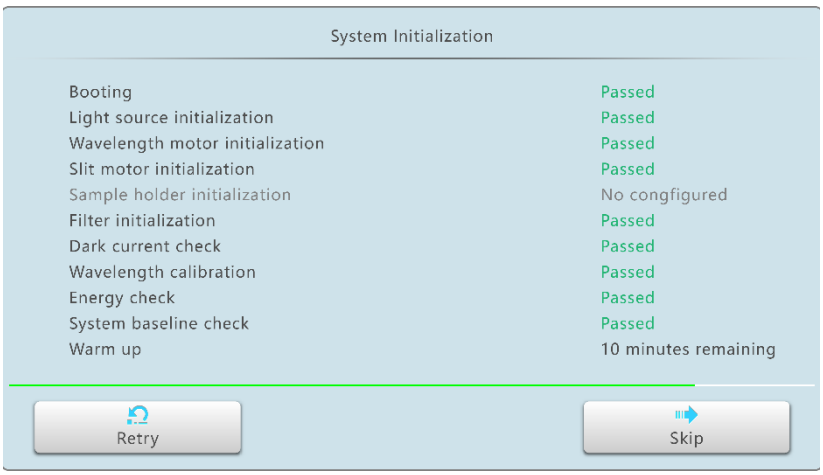
> **Note** *Do not turn the instrument on and off continuously and quickly. Wait at least 30 seconds before turning the instrument back on, otherwise the electrical and mechanical systems may be damaged.*

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.

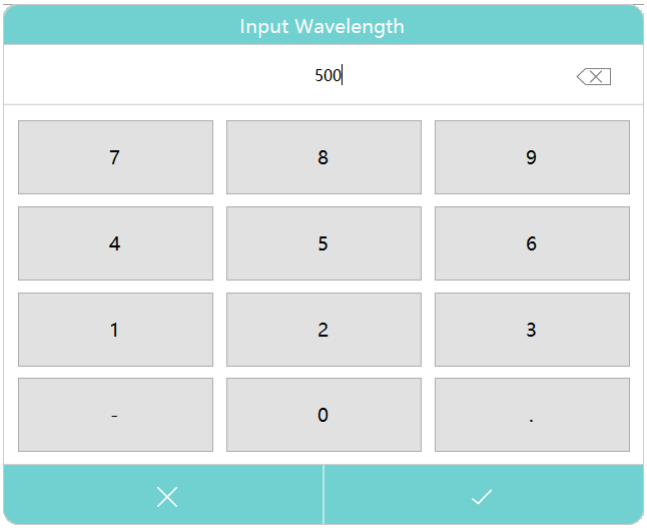
General Operating Instructions

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

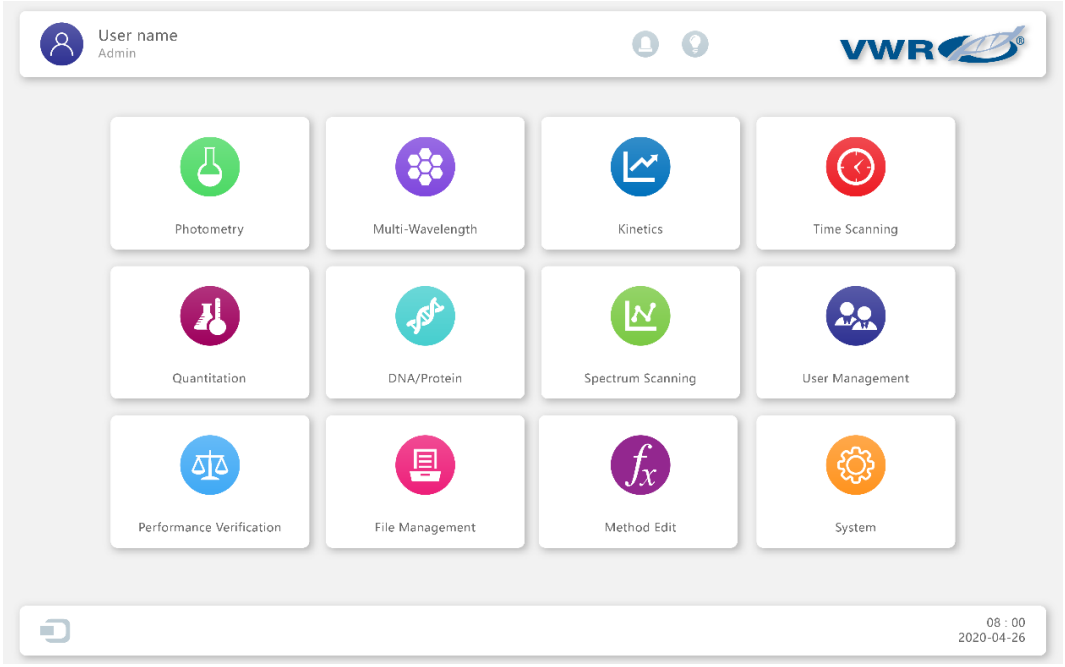
The instrument provides two kinds of keyboards for different situations. The numeric keypad is used to input parameters, and the full keyboard is used to input user information and file names.



Basic Operation

Enter an application module

Main interface, press an application icon enter to measurement interface.



	Photometry Measuring the photometric value of a sample at a single wavelength.
	Multi wavelength Measuring the photometric value of a sample at multiple wavelengths.

	**Kinetics** Measuring the change in absorbance or absorbance change rate over time at a specified wavelength.
	**Time scanning** Measuring 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 method measurement** Measuring DNA, RNA and protein concentrations using built-in methods or new methods.
	**Spectrum scanning** Measuring the photometric curve of a sample over a range of spectra.
	**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.

Do blank/Scan baseline

Measurement interface, put “Reference” in reference channel and measurement channel, press  to do blank/scan baseline.

Measuring sample

Measurement interface, put “Reference” in reference channel and “Sample” in measurement channel, press  to do blank/scan baseline.

Enter data /curve list

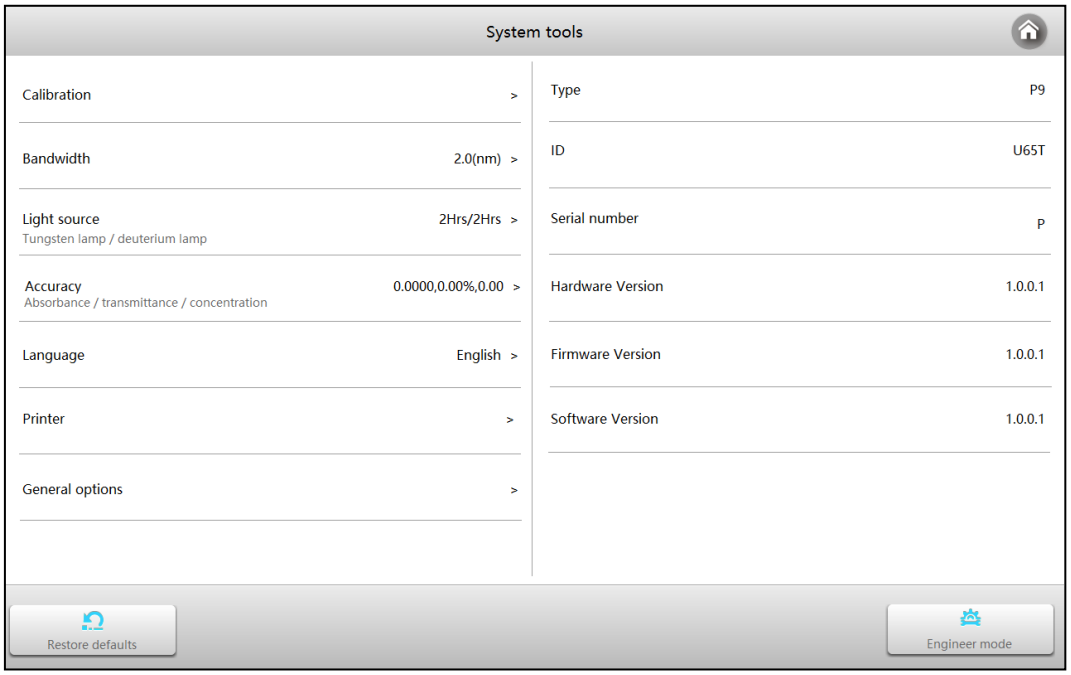
Measurement interface, press  to enter data/curve list.

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 MS Word file format** Export file to PDF format.
	**Delete** Delete the selected results.

Calibration and System Settings

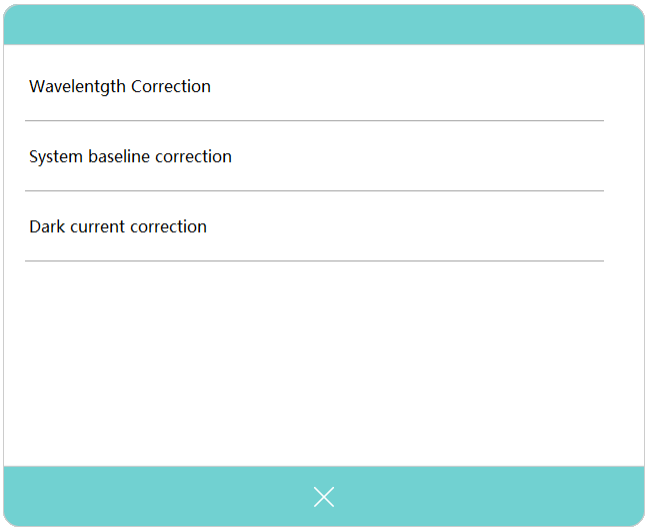
Select the icon  in the main interface. Display options to calibrate the system and configure the basic instrument settings.



Calibration

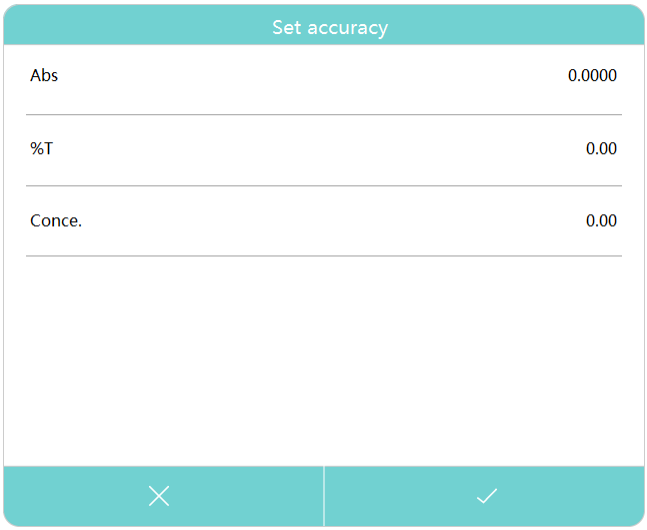
Select the tab **Calibration** in the System interface. Remove something from the measurement channel, close the sample chamber cover, and select the item **Wavelength calibration**, **System baseline calibration** or **Dark current calibration** to do calibration.

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.***



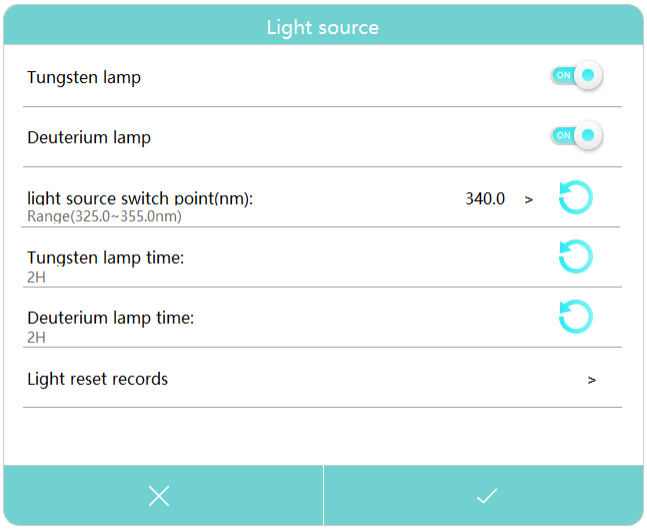
Result resolution setting

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



Light source management

Press the tab **Light source**, which displays the usage timing of the light source and the switching wavelength of the light source.



- **Turn on/off lamp**

  Press the icon  to turn on/off Tungsten lamp/Deuterium lamp.

Note *When using a single light source for a long time, you can turn off another unused light source to save light source life and energy.*

- **Set the light source switching wavelength**

  Press the current switching wavelength, pop up the numeric keyboard, input the switching wavelength, and press the button  to complete the setting.

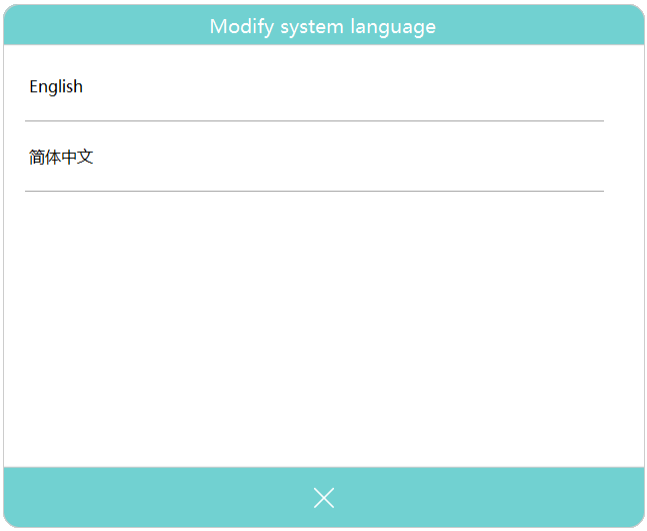
Note ***After modifying the light source switching wavelength, you need to calibrate system baseline.***

Press the icon  to reset the Tungsten lamp/Deuterium lamp timing.

Note *To ensure the accuracy of the light source timing, perform the corresponding light source clear after replacing the light source. Do not operate at other times.*

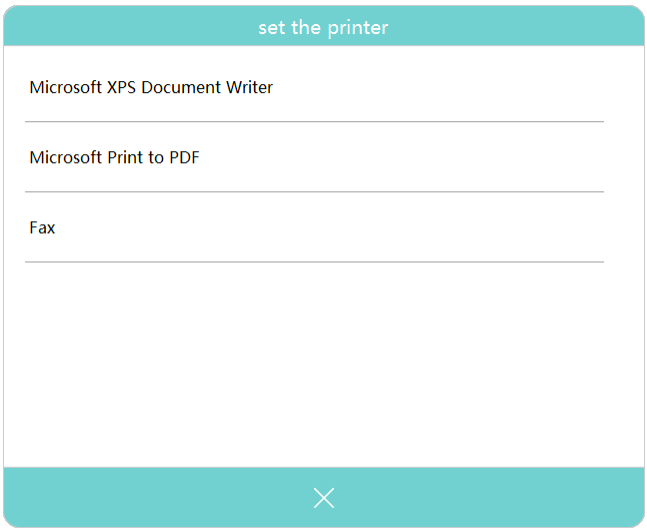
Language setting

Press the tab **Language** and select the desired language.



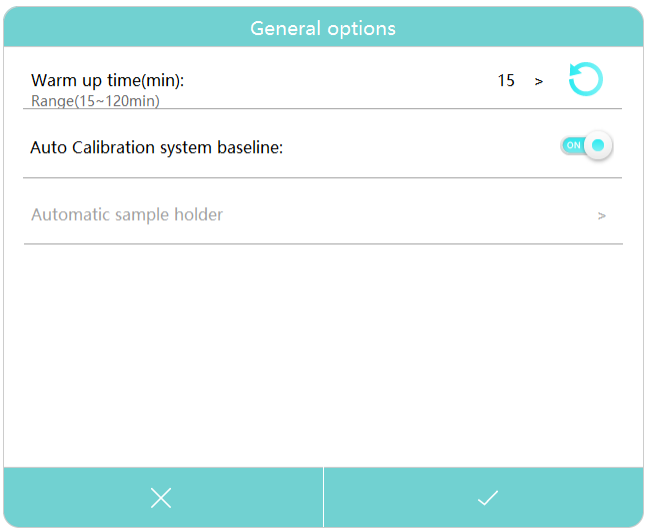
Printer setting

Press the tab **Printer** and select the installed printer.



General settings

Press the tab "General" to enter.



- **Warm up**

  Press "Warm up" , pop up numeric keyboard, input value 1~120 minutes， and press the button  to complete the setting.

- **Calibrate system baseline when boot**

  Press the icon  to turn on/off the "Calibrate 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.

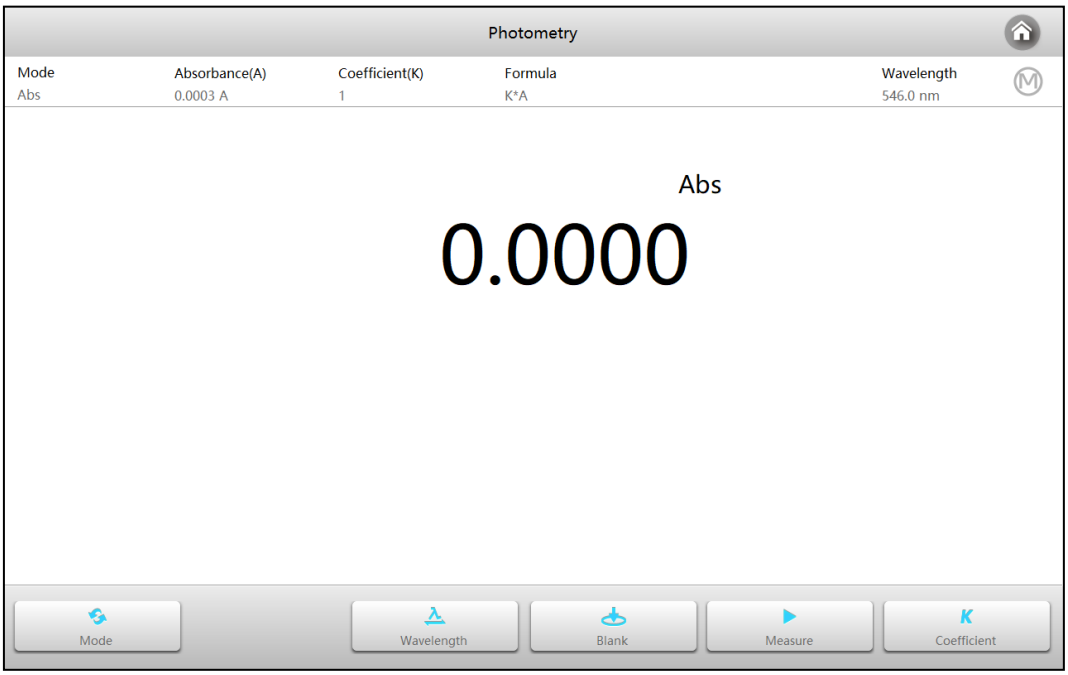
Check the cuvettes

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 range of UV area.**

Photometry

Photometry mode is used to measure the absorbance or transmissivity 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).

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 K to set the coefficient K.

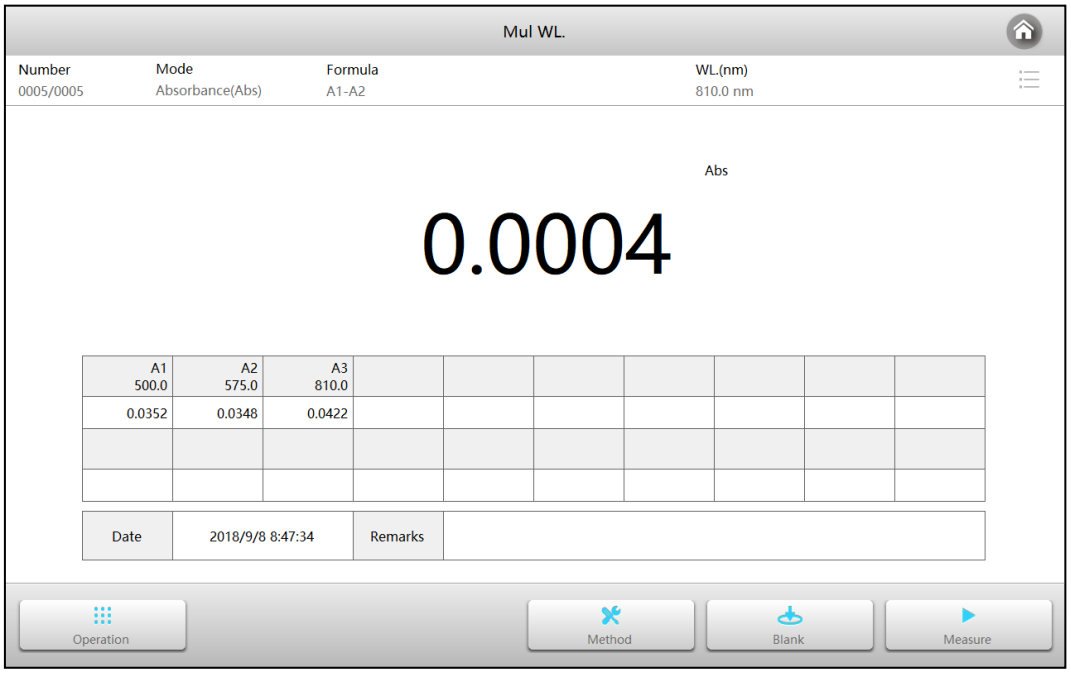
4. Put the reference in the measurement channel and reference channel, press the button to do blank.

5. Put the sample in the measurement channel, read the result.

Multi-wavelength

Multi-wavelength mode is used to measure the absorbance or transmissivity of the sample at multiple wavelengths.

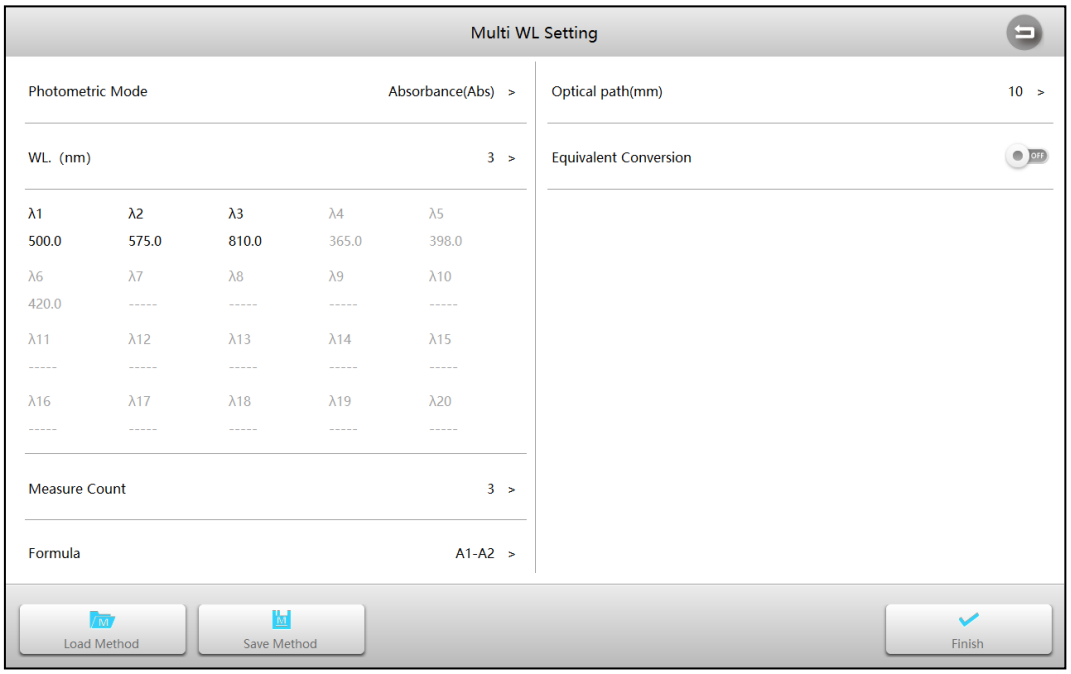
Main interface, press the icon to start a **Multi-wavelength** application.



1. **Multi-wavelength measurement** 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.



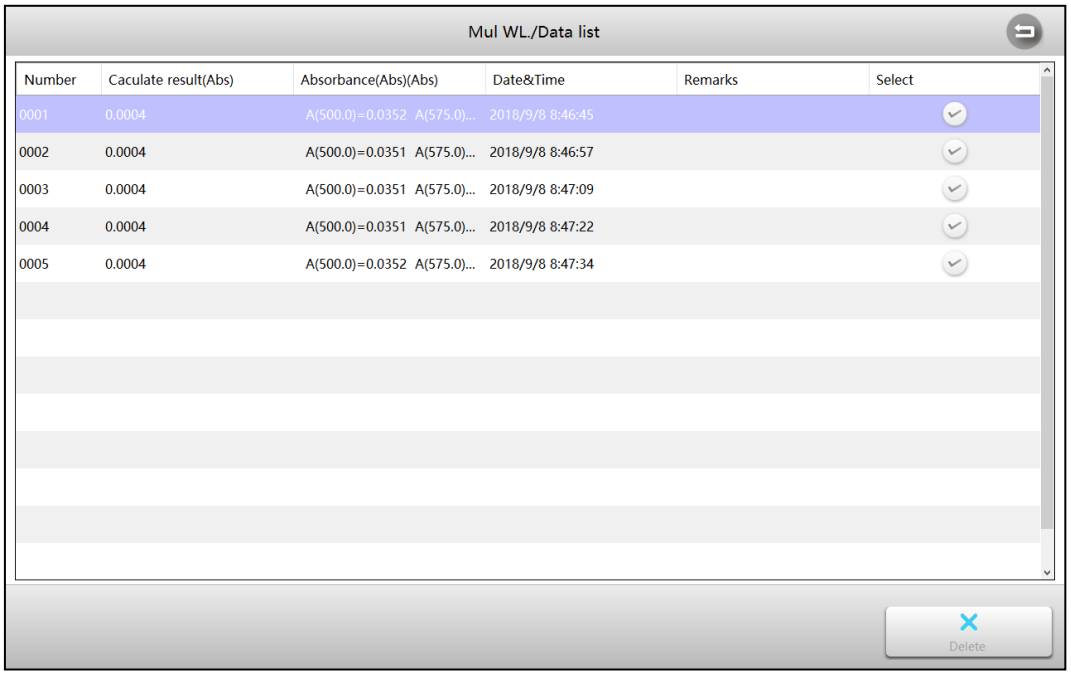
Photometric mode	2 photometric modes: absorbance, transmittance.
Wavelength	1~20 wavelengths are available, wavelength range: 190~1100nm.
Cycles	1, 2, 3, 5, 10, 20, 30, 50 times can be selected, the instrument will calculate the average as the final output.
Calculation formula	The instrument can choose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

2. Put the reference in the measurement channel and reference channel, close the sample chamber cover, and press the button to do blank.

3. Put the sample in the measurement channel, close the sample chamber cover, and press the button to measure and calculation results.

4. Repeat step 3 to measure more samples.

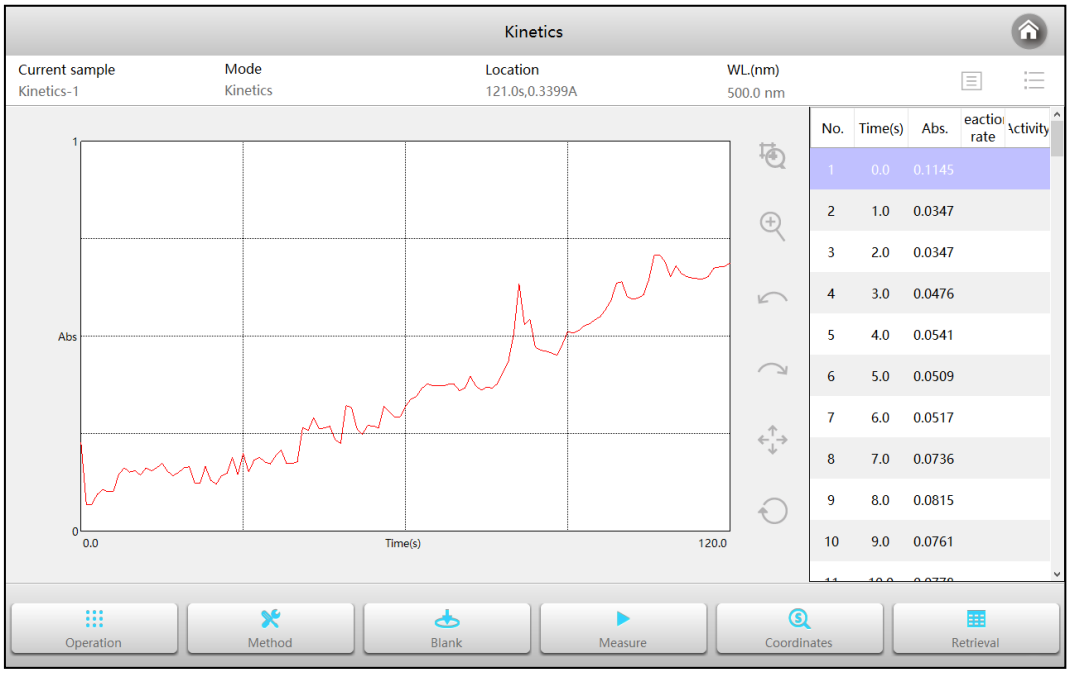
5. Press to switch to list mode to browse the list of measurement results.



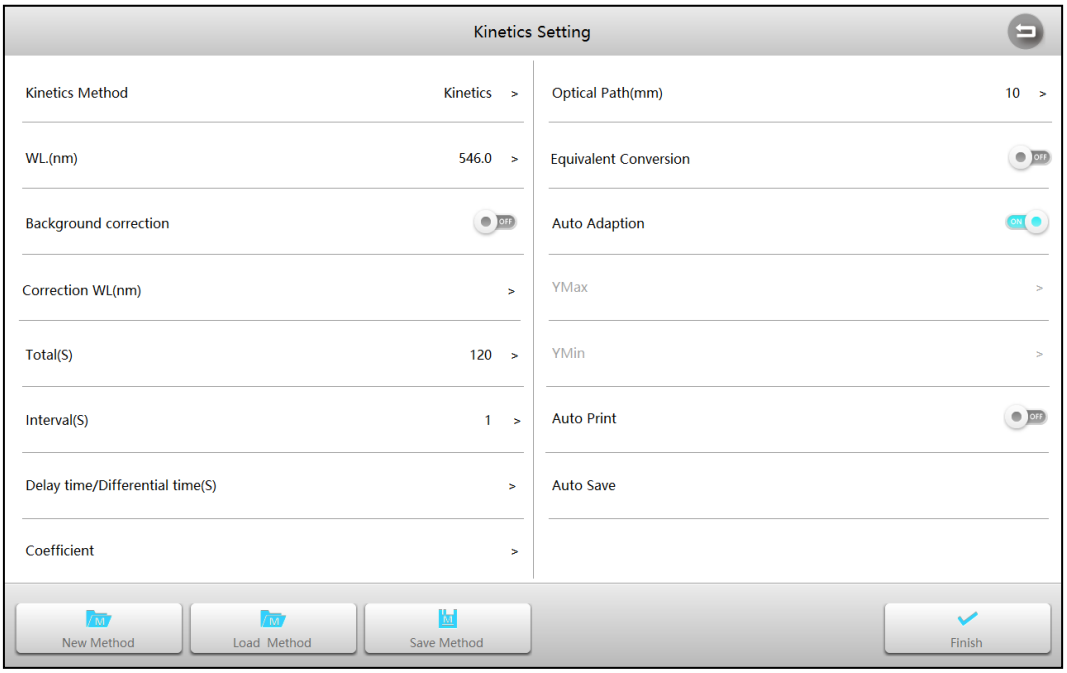
Kinetics

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 measurement** 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.


Kinetics Setting
Kinetics Method
Kinetics
WL.(nm)
546.0
Background correction
OFF
Correction WL(nm)
Total(S)
120
Interval(S)
1
Delay time/Differential time(S)
Coefficient
Optical Path(mm)
10
Equivalent Conversion
OFF
Auto Adaption
ON
YMax
YMin
Auto Print
OFF
Auto Save
New Method
Load Method
Save Method
Finish

Measurement mode	2 measurement modes: kinetics, kinetic rate.
Wavelength	Measured 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	Measure the 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.
Optical path	The width of the cuvette used for the measurement.
Equivalent conversion	Activation 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	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 measurement channel and reference channel, close the sample chamber cover, and press the button  to do blank.

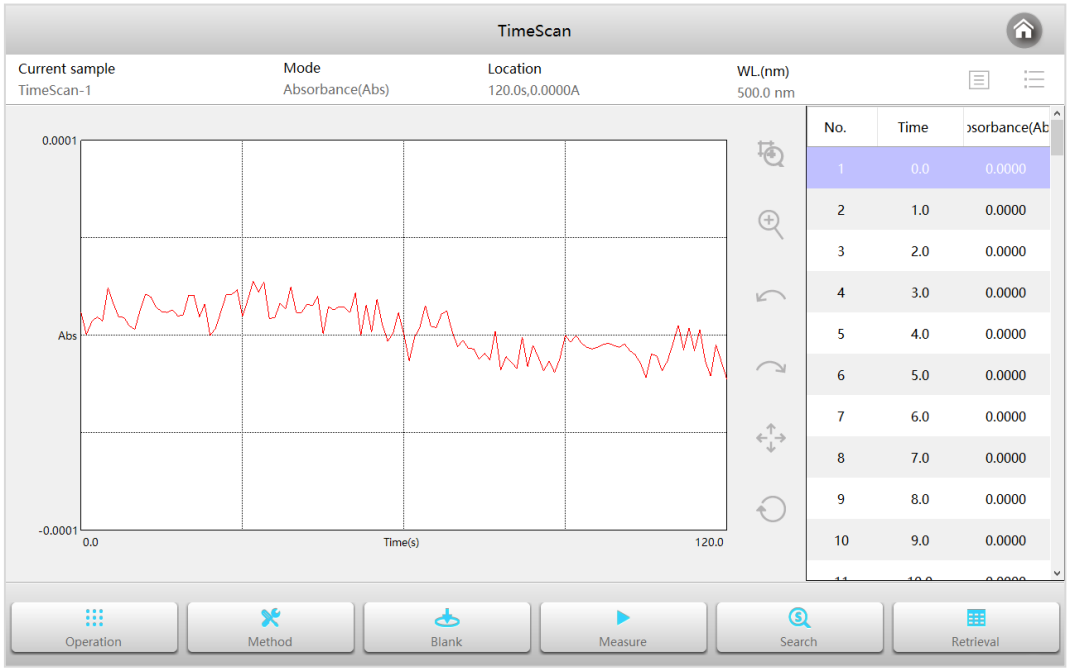
3. Put the sample in the measurement channel, close the sample chamber cover, and press the button  to measure and get sampled data and draw the curve.

4. Repeat step 3 to measure more samples.

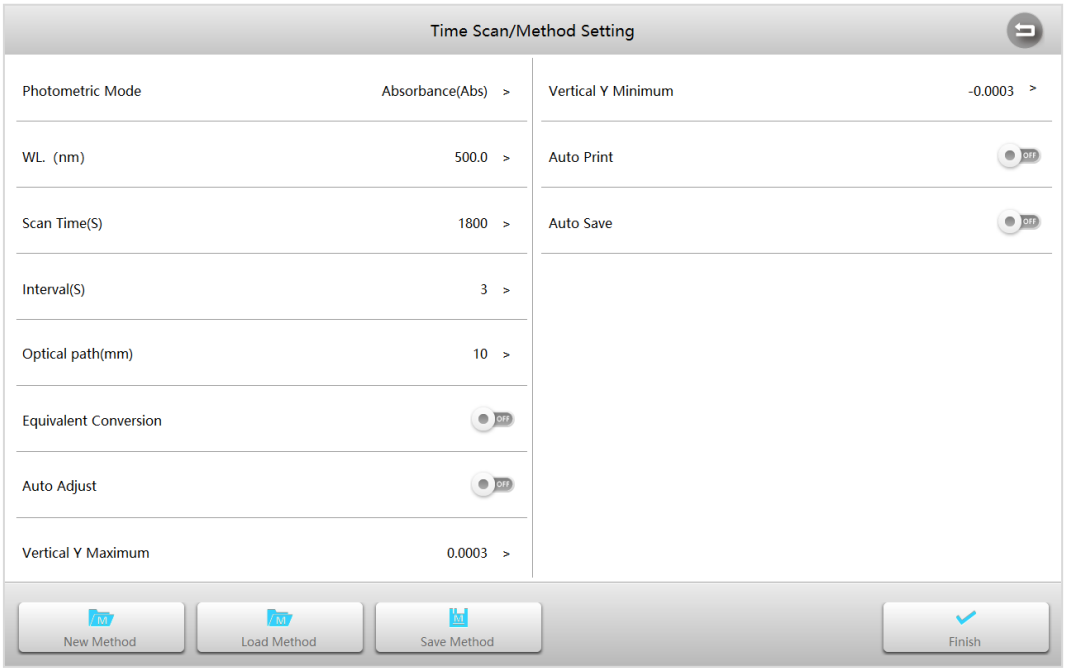
Time scanning

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 measurement** 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	2 photometric modes: absorbance, transmittance.
Wavelength	Measurement wavelength, range: 190~1100nm.
Total	Measure the total sampling time required.
Interval	Sampling interval.
Optical path	The width of the cuvette used for the measurement.
Equivalent conversion	Activation 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	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 measurement channel and reference channel, close the sample chamber cover, and press the button to do blank.

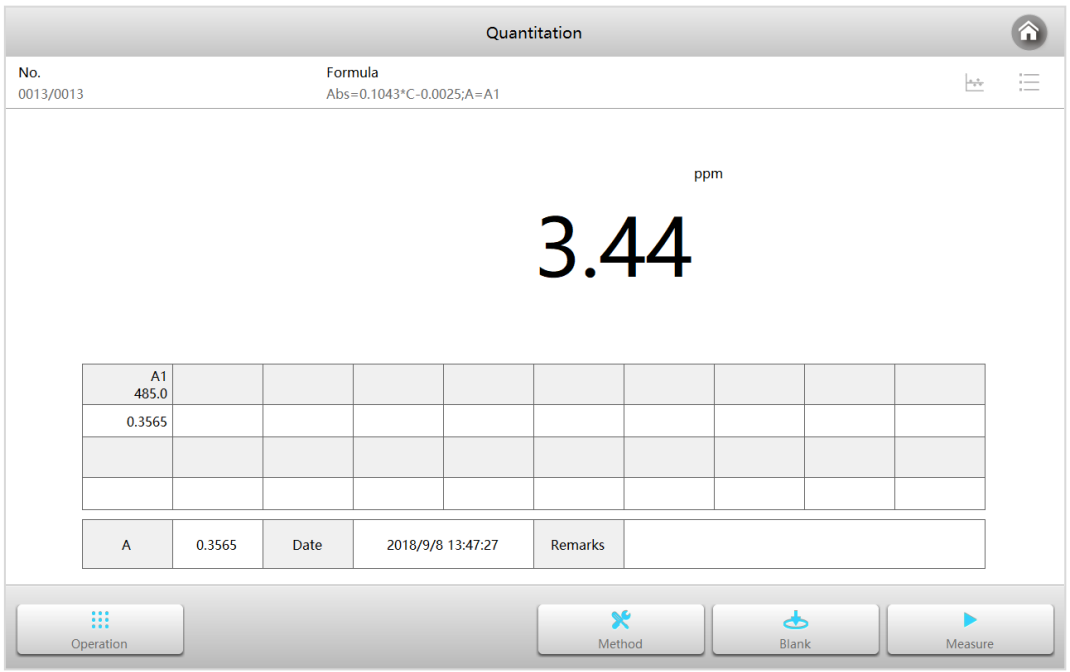
3. Put the sample in the measurement channel, close the sample chamber cover, and press the button to measure and get sampled data and draw the curve.

4. Repeat step 3 to measure more samples.

Quantitation

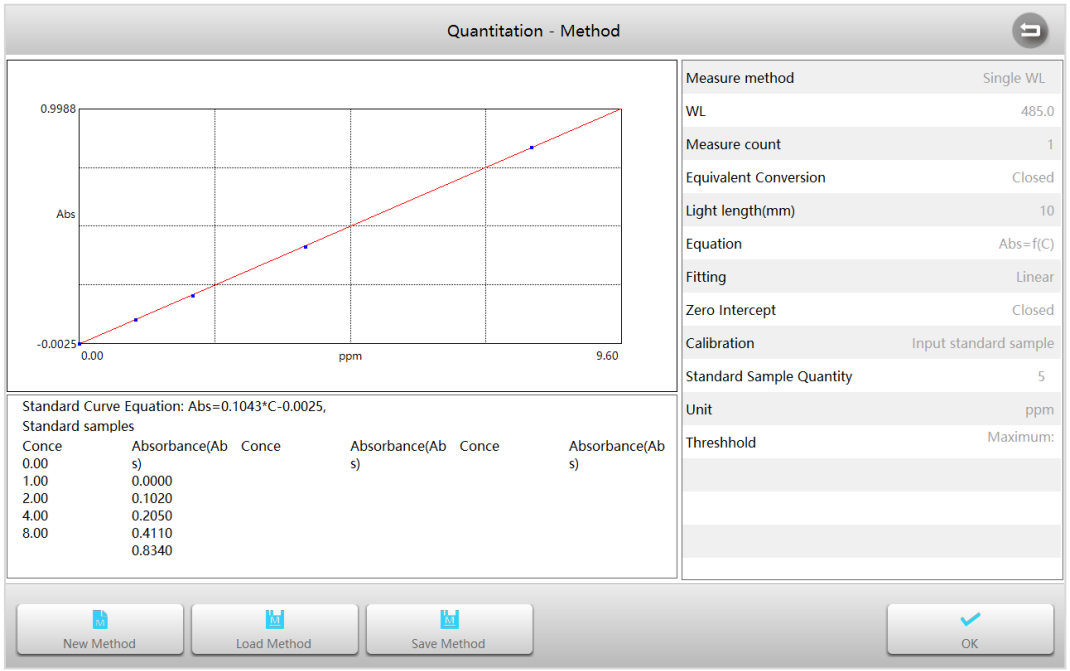
Quantitation mode is used to measure sample concentration by establishing and using a standard curve.

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

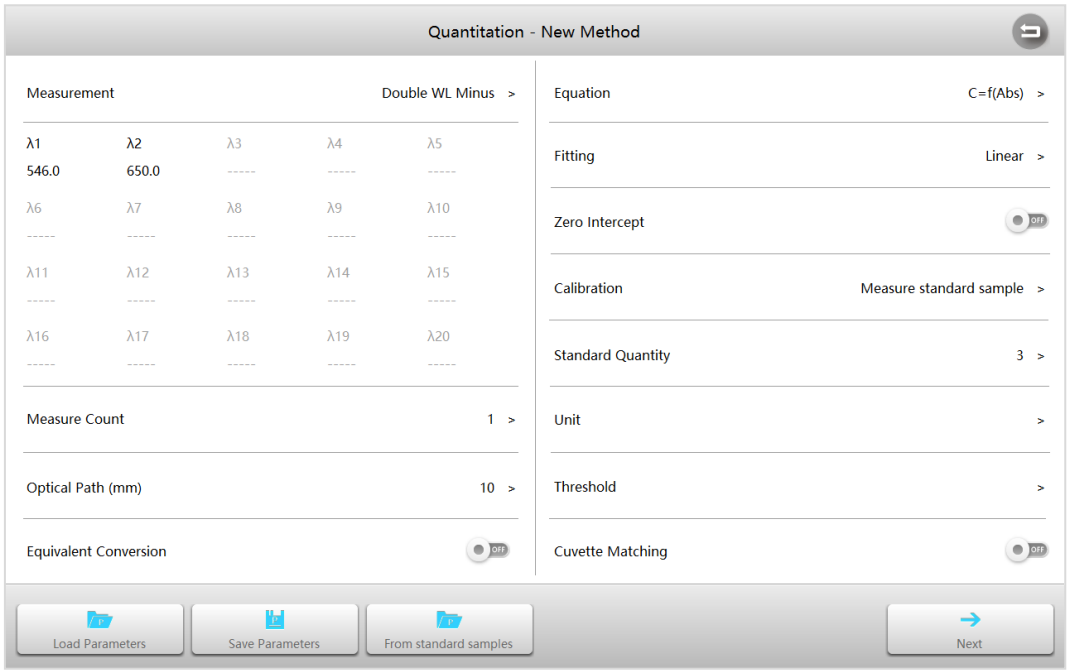


Establish quantitative methods

1. **Quantitation 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.



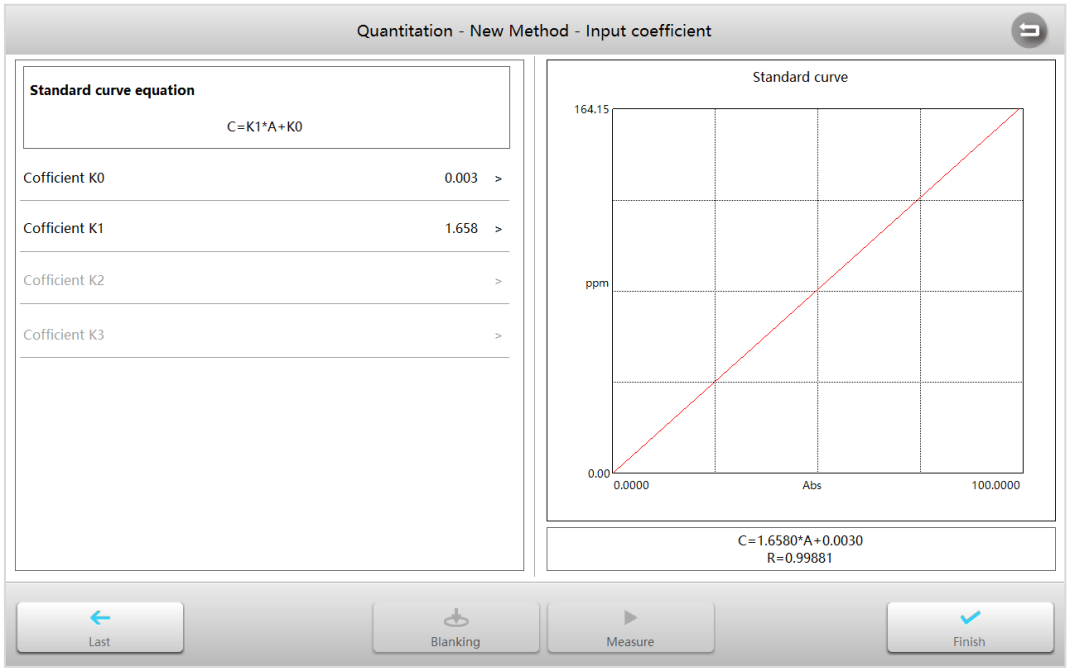
Measurement	Built-in single wavelength, dual wavelength difference, dual wavelength ratio, three wavelengths, area 5 ways, and support custom formula.
Wavelength	Measuring wavelength, range: 190~1100nm.
Circle	1, 2, 3, 5, 10, 20, 30, 50 times can be selected, the instrument will calculate the average as the final output.
Optical path	The width of the cuvette used for the measurement.
Equivalent conversion	Activation 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	Turning on the representative fitting curve will directly cross the zero point, and closing will represent the fitting curve but the zero point.
Calibration	3 ways to generate a standard curve: input equation coefficient method, standard sample method and input standard sample.
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 sample calibration and standard sample input), quantity: 2~20.
Threshold	Upper and lower limits of measurement results.

3. Establish standard curve

3.1 Establish 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.

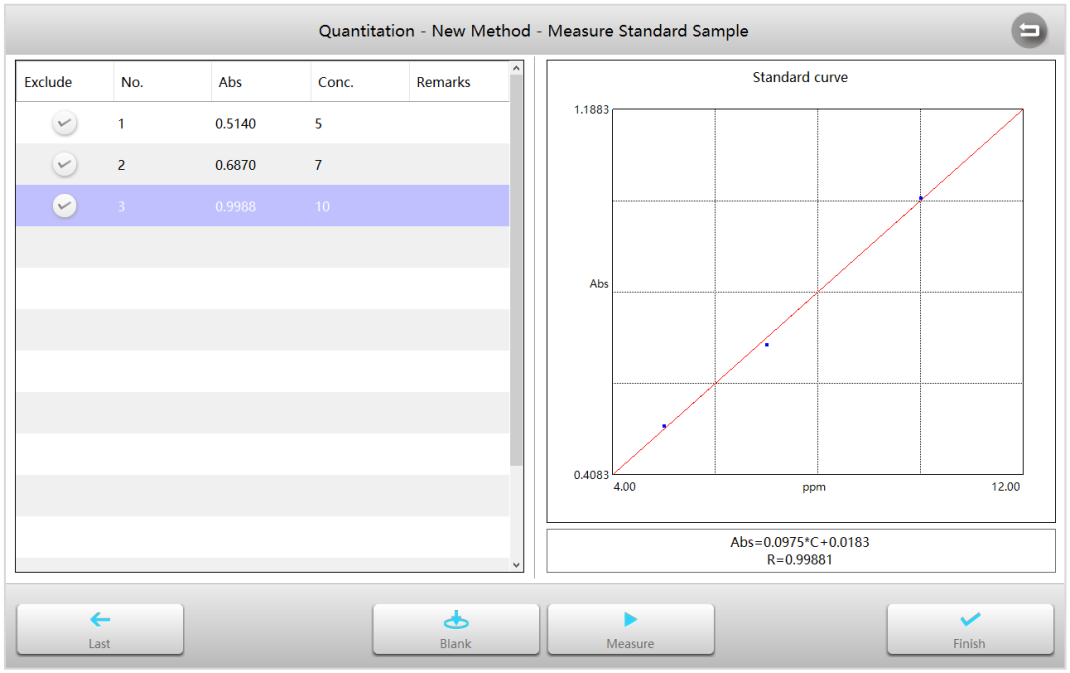
2) **Input Equation Coefficient** interface, press the coefficient K0~Kn to pop up the keyboard and enter the coefficient.



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 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.



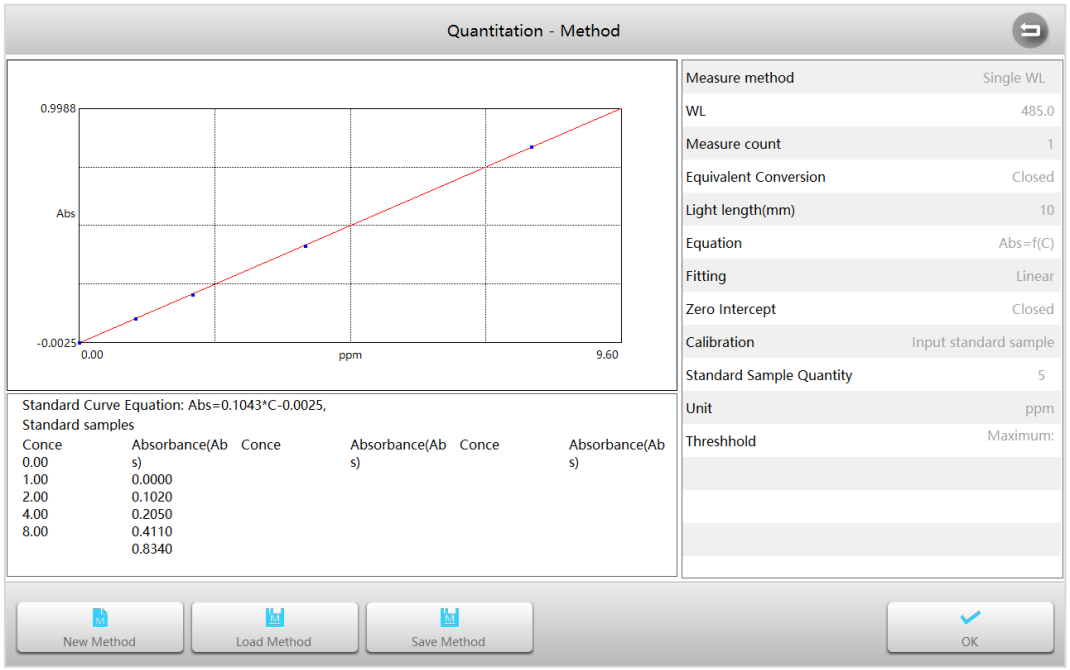
2) **Measure standard sample** interface, put the reference in the measurement channel and reference channel, close the sample chamber cover, and press the button to do blank.

3) Put the standard sample in the measurement channel, close the sample chamber cover, and press the button to measure.

4) Repeat step 3 to measure all standard samples.

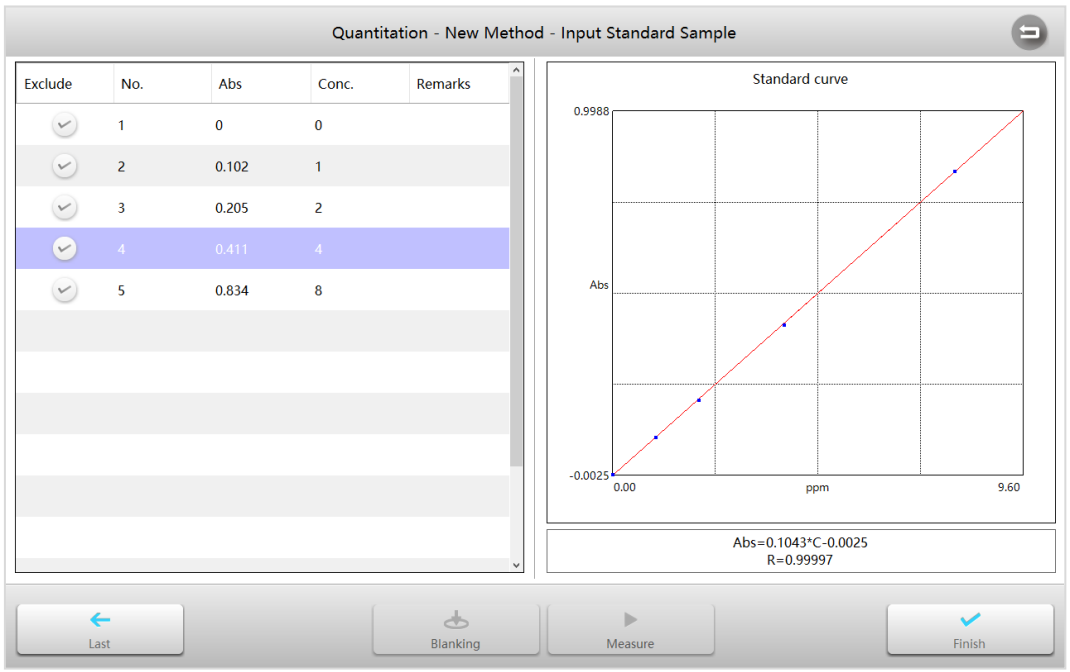
5) Press the concentration cell to enter the corresponding concentration value.

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



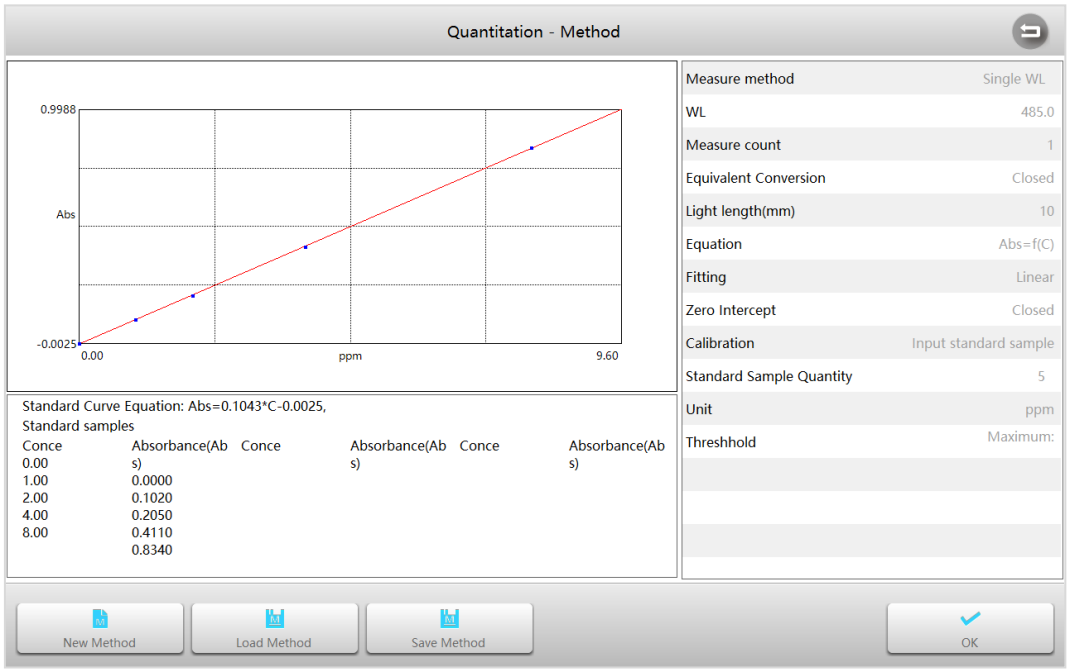
3.3 Establish standard curve by measuring standard samples

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 Abs value and press **Concentration** 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 measurement** interface, press the button to enter into **Method** interface.

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

3. Put the reference in the measurement channel and reference channel, close the sample chamber cover, and press the button to do blank.

4. Put the sample in the measurement channel, close the sample chamber cover, and press

the button to measure and calculation results.

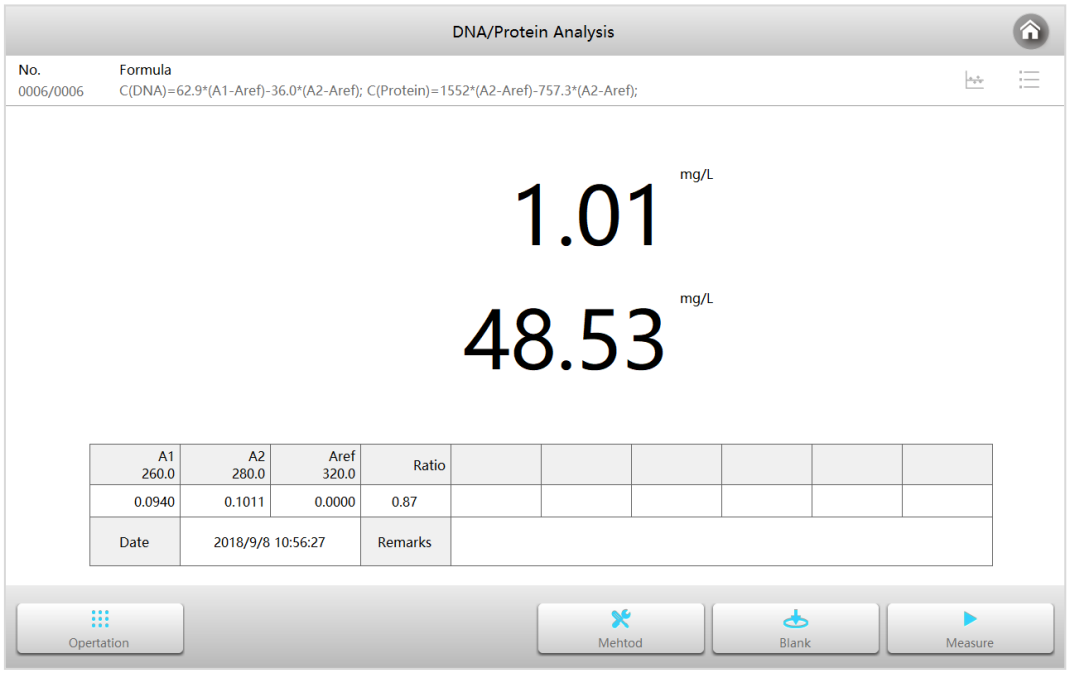
5. Repeat step 4 to measure more samples.

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

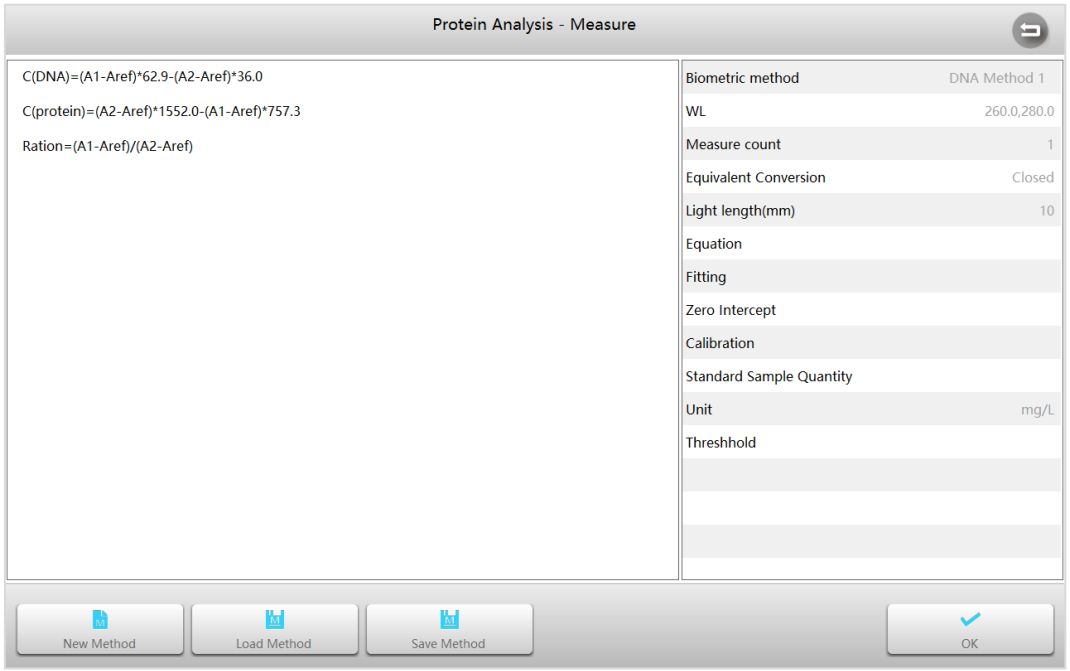
Biological method

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

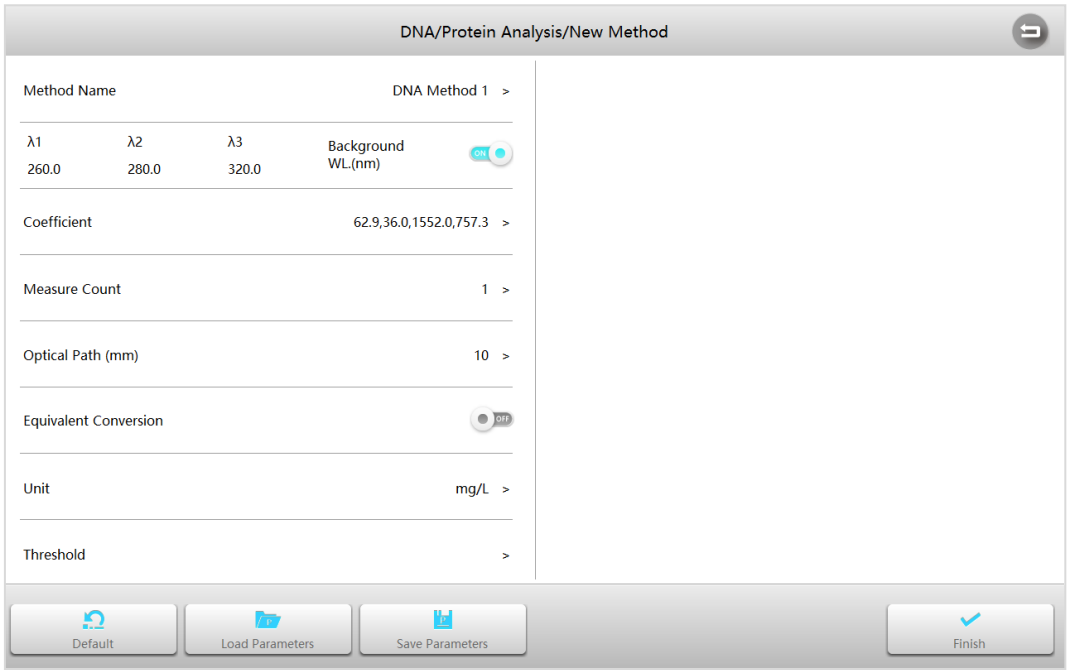
Main interface, press the icon to start a **Biological method measurement** application.



1 **Biological method 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	Built-in7methods: 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)
Optical path	The width of the cuvette used for the measurement.
Equivalent conversion	Activation 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 or new a method, press the button to accept and return to measurement interface.

4 Put the reference in the measurement channel and reference channel, close the sample chamber cover, and press the button to do blank.

5 Put the sample in the measurement channel, close the sample chamber cover, and press the button to measure and calculation results.

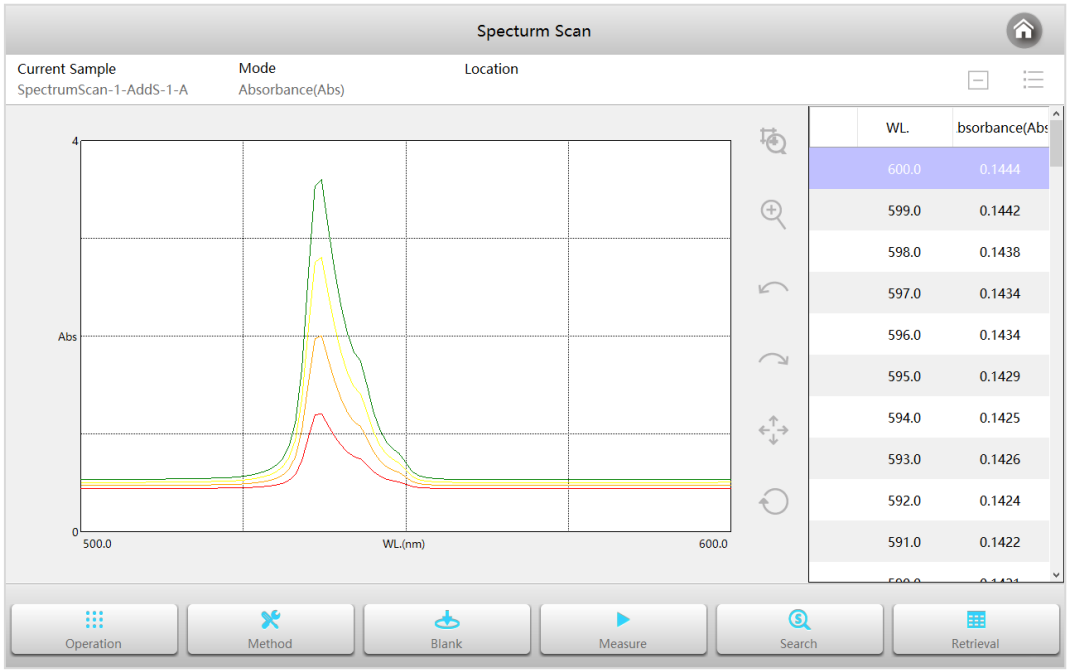
6 Repeat step 5 to measure more samples.

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

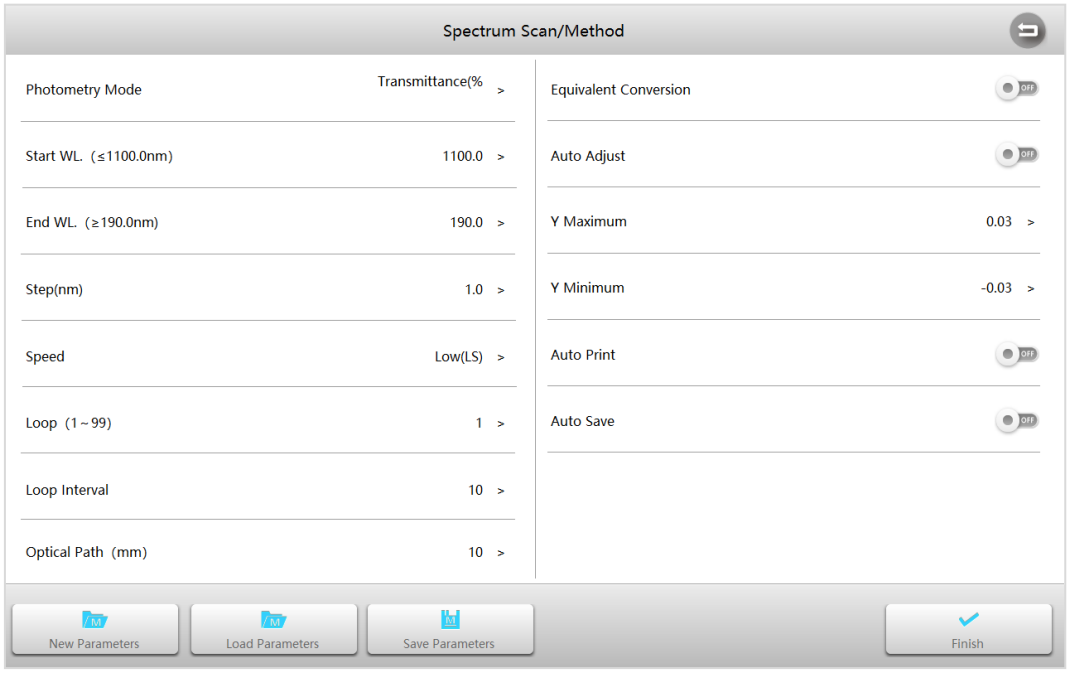
Spectrum scanning

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

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



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



Measurement mode	2 measurement modes: kinetics, kinetic rate.
Start wavelength	Scan start wavelength, range: 190~1100nm.
End wavelength	Scan end wavelength, range: 190~1100nm.
Interval	6 wavelength interval selectable 0.1，0.2，0.5，1.0，2.0，5.0 nm
Speed	3 scan speed selectable：Quick, Medium, Slow.
Circle	Scan times.
Time interval	Interval between 2 scans.
Optical path	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 measurement channel and reference channel, close the sample chamber cover, and press the button  to scan baseline.

3. Put the sample in the measurement channel, close the sample chamber cover, and press the button  to scan sample and draw the curve.

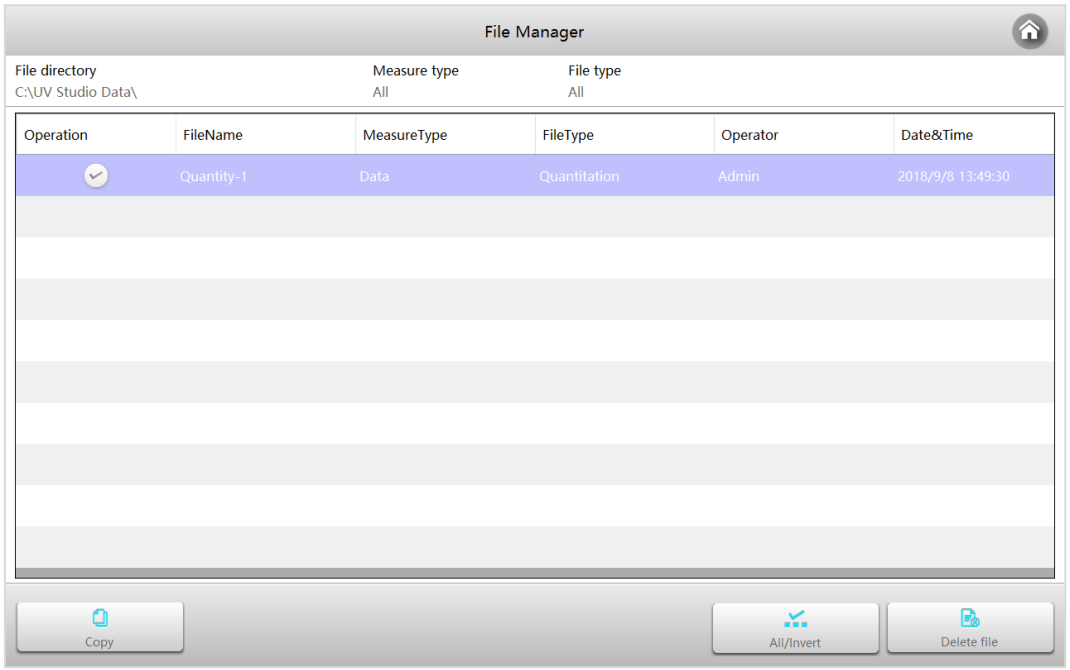
4. After the scan is complete, press the button  to zoom the graph as needed.

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 Mode** and **Type** to set the filter conditions and display the corresponding file types.

Delete files

Select the file you want to delete to make it selected, then press the button  to delete it.

Copy files

Select the files you want to copy to make it selected, then press the button  , pop up the **Path selection** form, select target path and press the button  .

Rename file name

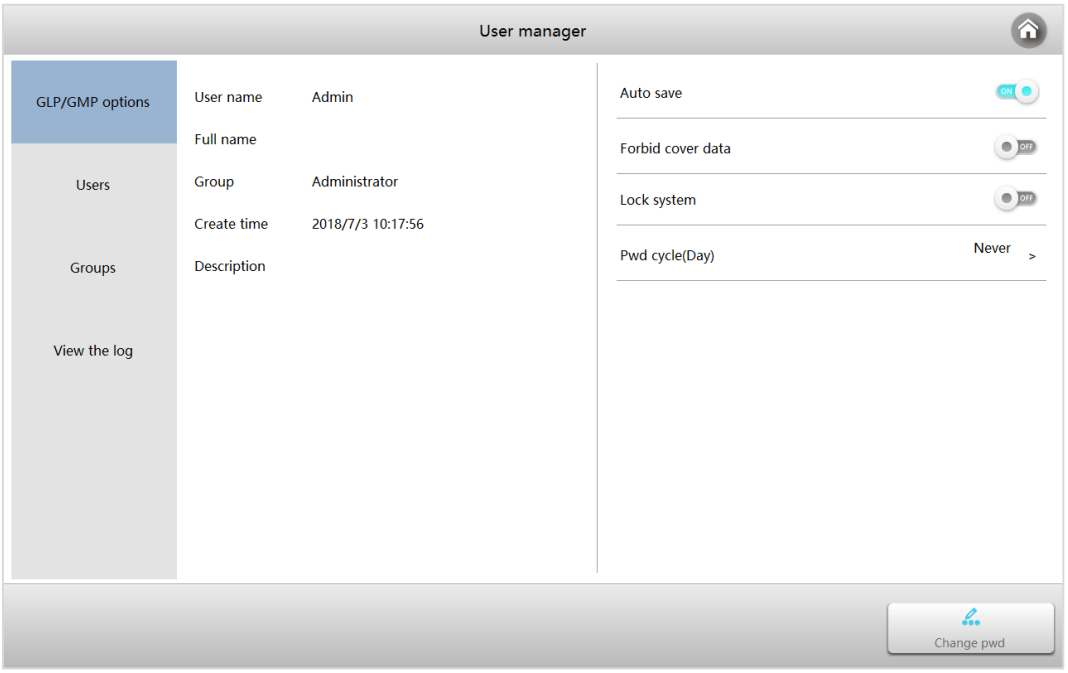
Press the file name you want to rename, pop up the keyboard, enter a new file name, and press the button  to complete the modification.

User management and audit trail

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

Main interface, press the icon  to start File management.

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



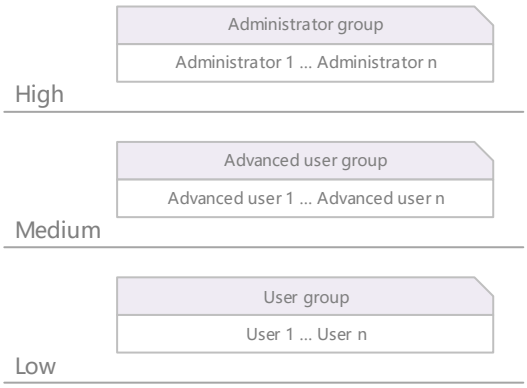
GLP/GMP option

GLP/GMP option contains four GLP/GMP options: "Automatic Data Saving", "Disable Overwriting

Data", "Allow Locking System" and "Password Replacement Period", which can be enabled/disabled by the administrator as needed.

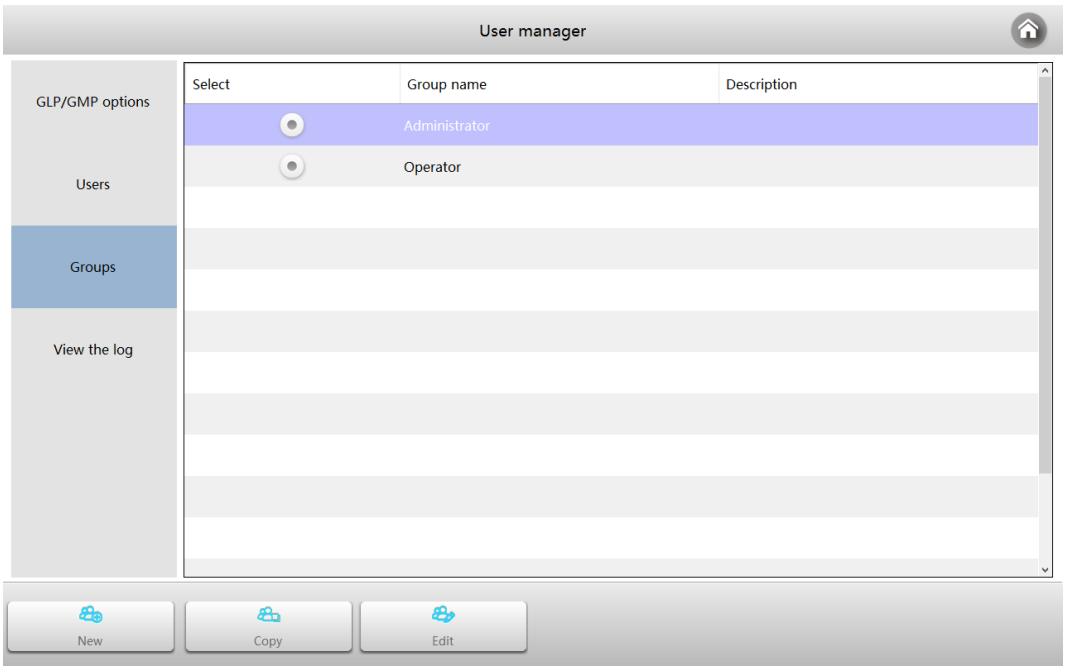
Users and user groups

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.



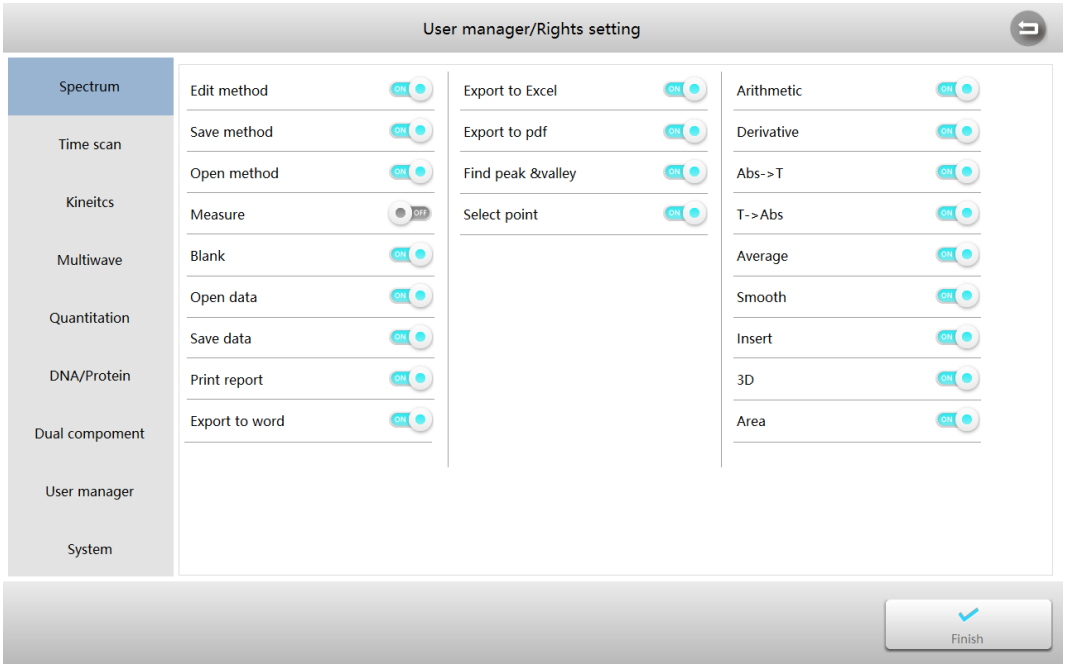
Operation of user groups

User management interface, press the tab **Group** 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.

Operation of user

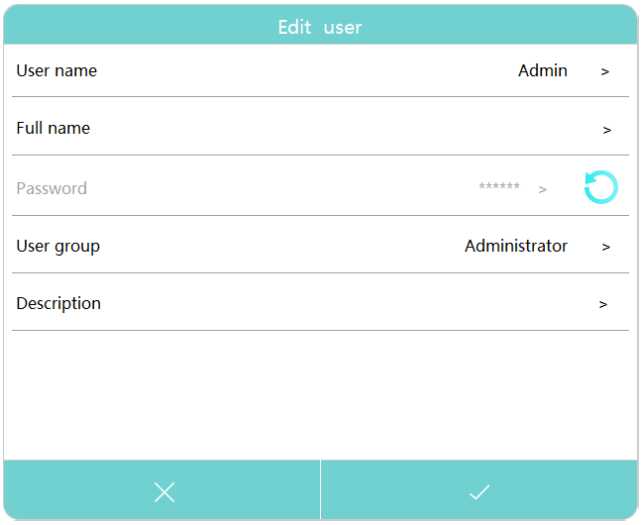
User management interface, press the tab **User** to enter user management.

- **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.

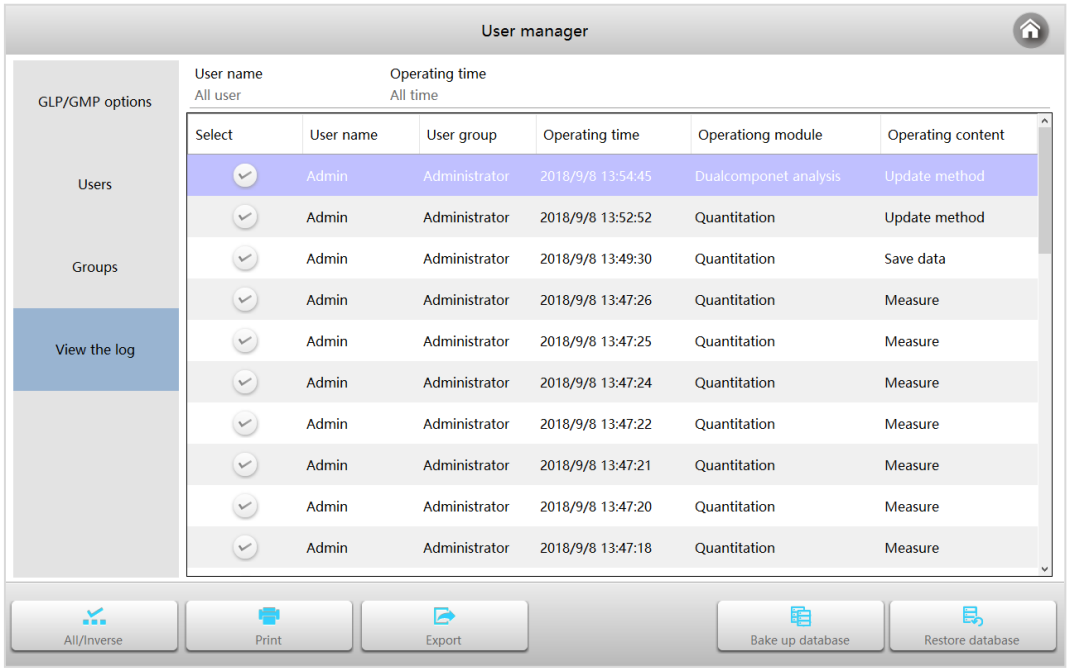


- **Lock/unlock user**

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.



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 to view the operation log of one (or all) users.

Print log

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

Export log

Select the log content to be printed, press the button , and select the export path to export the log content.

Database backup

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

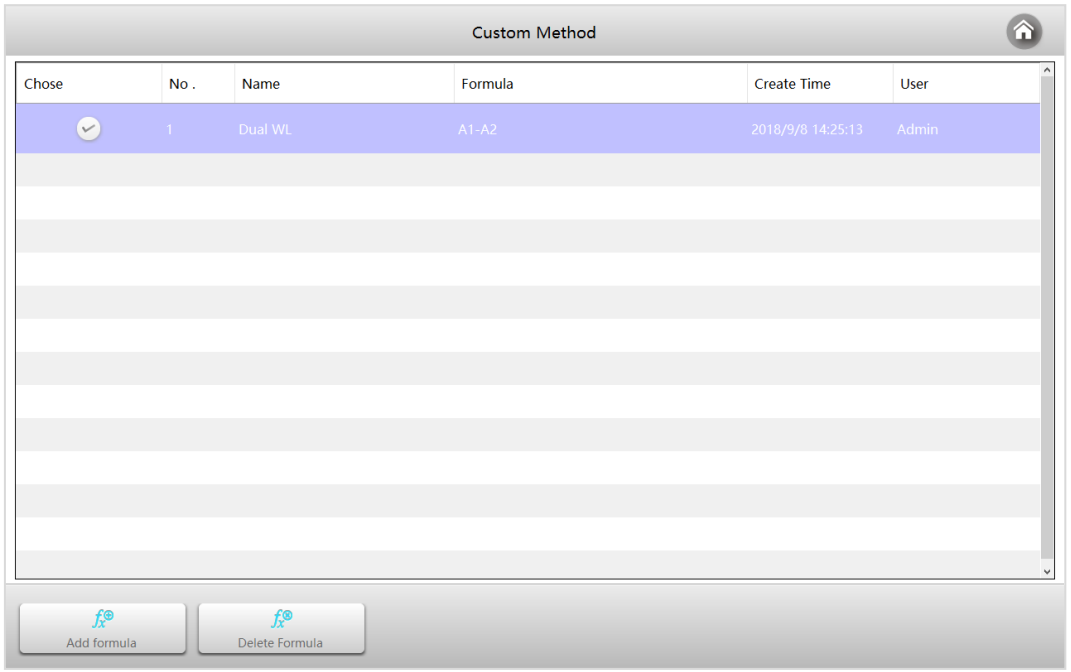
Database recovery

Press the button to select the backed up database file to restore the database to the instrument default storage location.

Formula editor

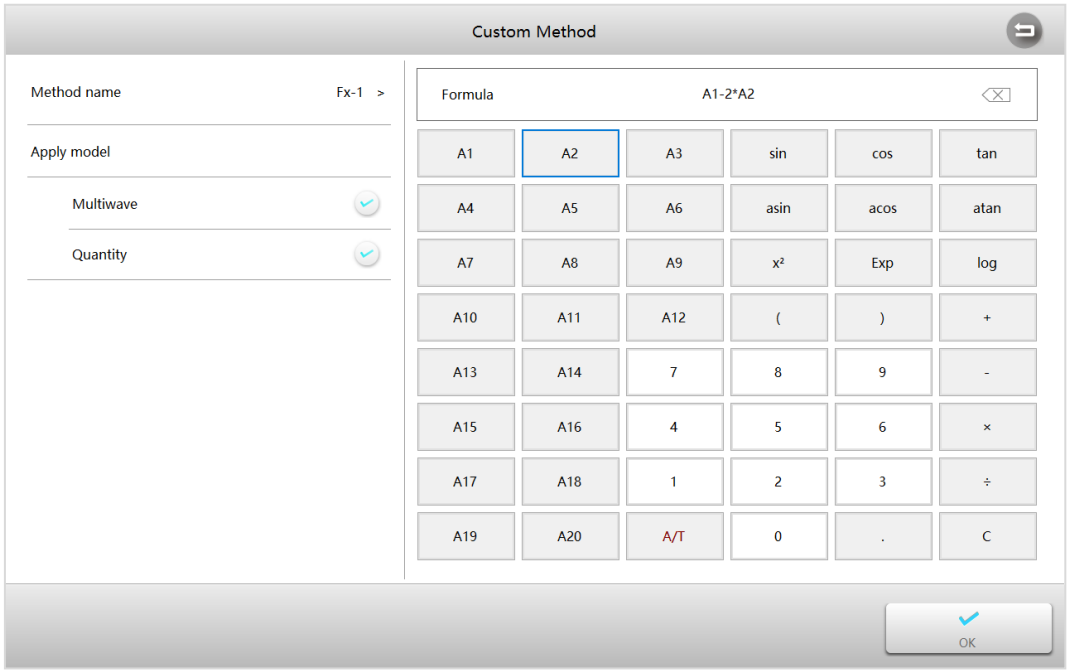
Method editor is used to write formulas for photometric calculations.

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



Add calculation formula

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



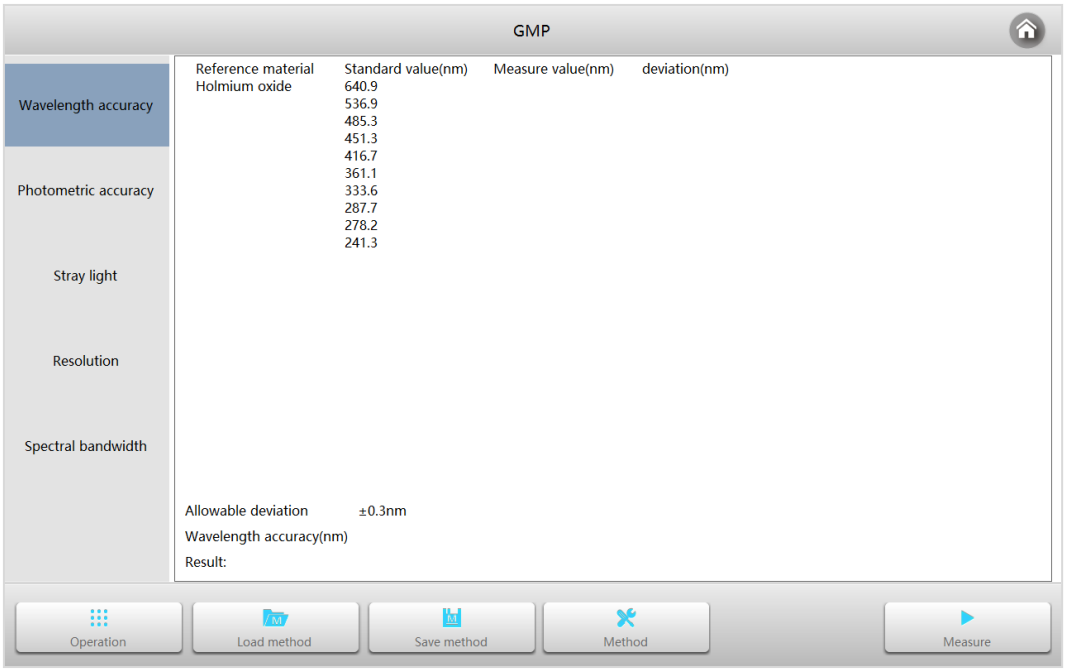
Delete calculation formula

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



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 from third parties or our company and are not configured with the instrument.*

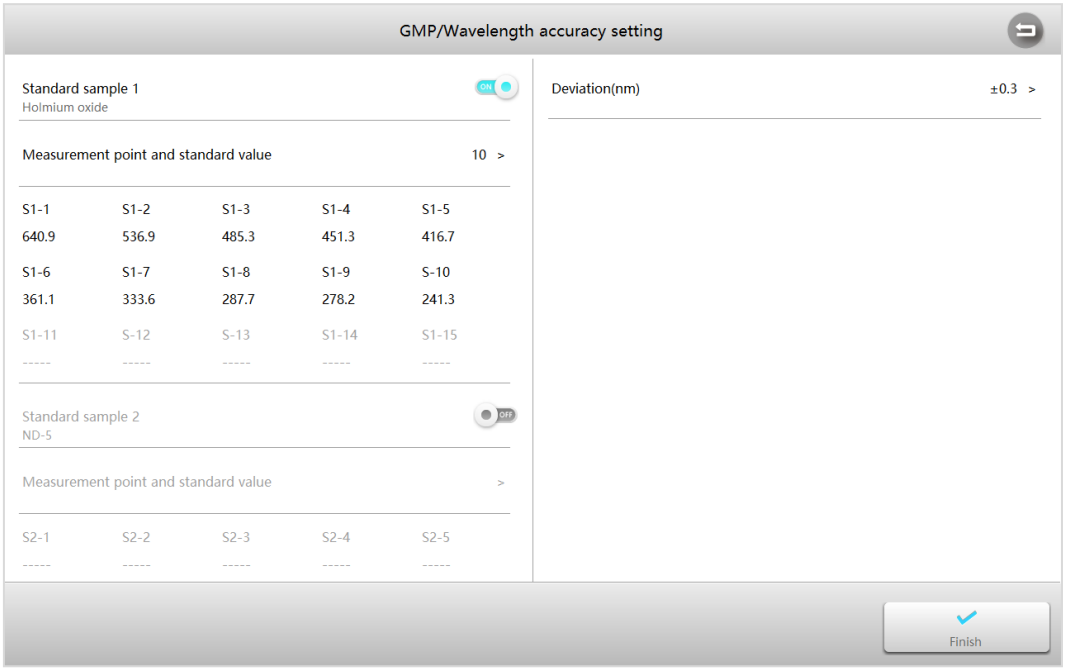
Wavelength accuracy and wavelength repeatability verification

Standard material

Holmium oxide solution or equivalent filter

Verification

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



2 Remove anything in the measurement channel, close the sample chamber cover, press the button and select the tab **Wavelength Accuracy** to start the measurement.

3 According to the instructions of the instrument, put the reference into the measurement channel to do blank, then put the standard material into the measurement channel and display the test result after completion.

Photometric accuracy and photometric repeatability verification

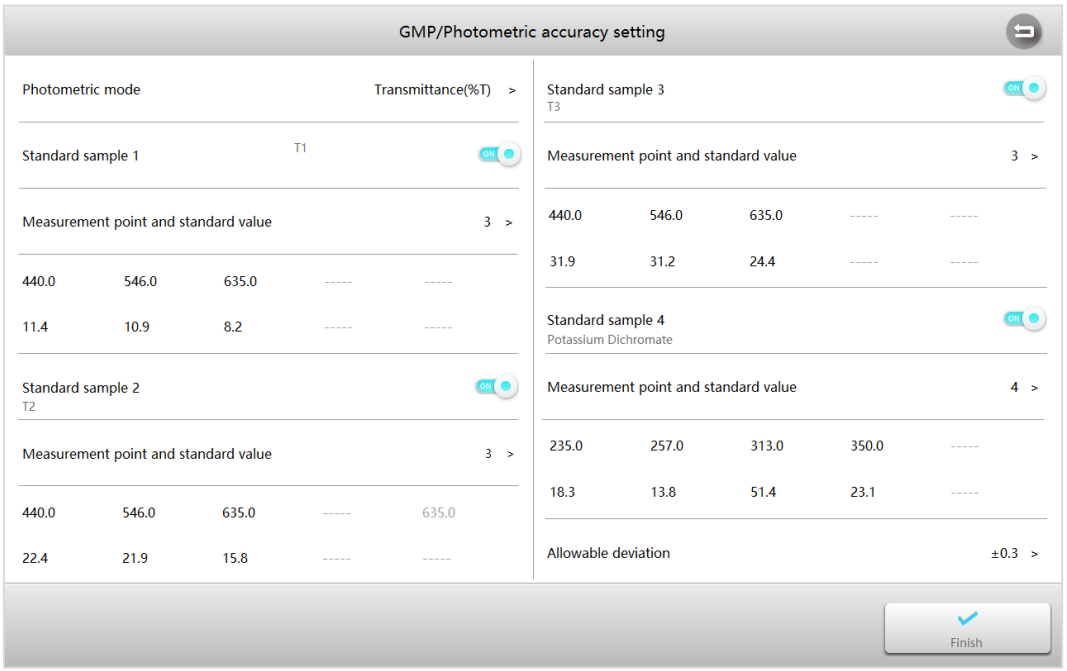
Standard material

NIST 930D or equivalent filter

Verification

1 **Performance Verification** interface, press the tab **Photometric Accuracy**, press the

button to enter the **Setting** interface, set parameters, and press the button to accept and back.



2 Remove anything in the measurement channel, close the sample chamber cover, press the button and select the tab **Photometric Accuracy** to start the measurement.

3 According to the instructions of the instrument, put the reference into the measurement channel to do blank, then put the standard material into the measurement channel and display the test result after completion.

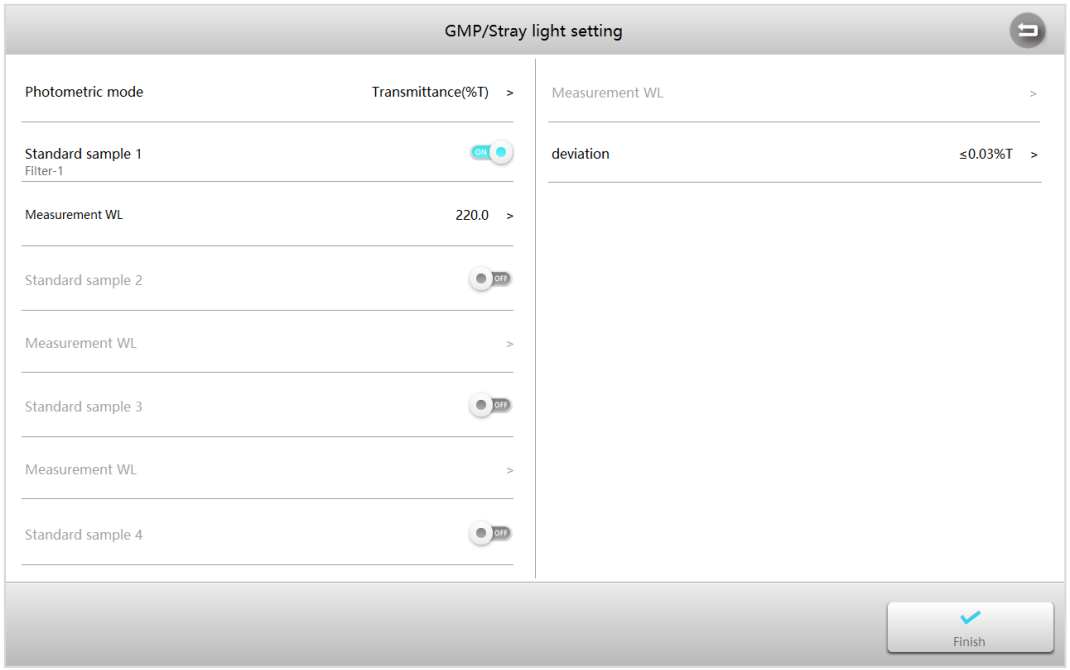
Stray light verification

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 to enter the **Setting** interface, set parameters, and press the button to accept and back.



2 Remove anything in the measurement channel, close the sample chamber cover, press the button and select the tab **Stray Light** to start the measurement.

3 According to the instructions of the instrument, put the reference into the measurement channel to do blank, then put the standard material into the measurement channel and display the test result after completion.

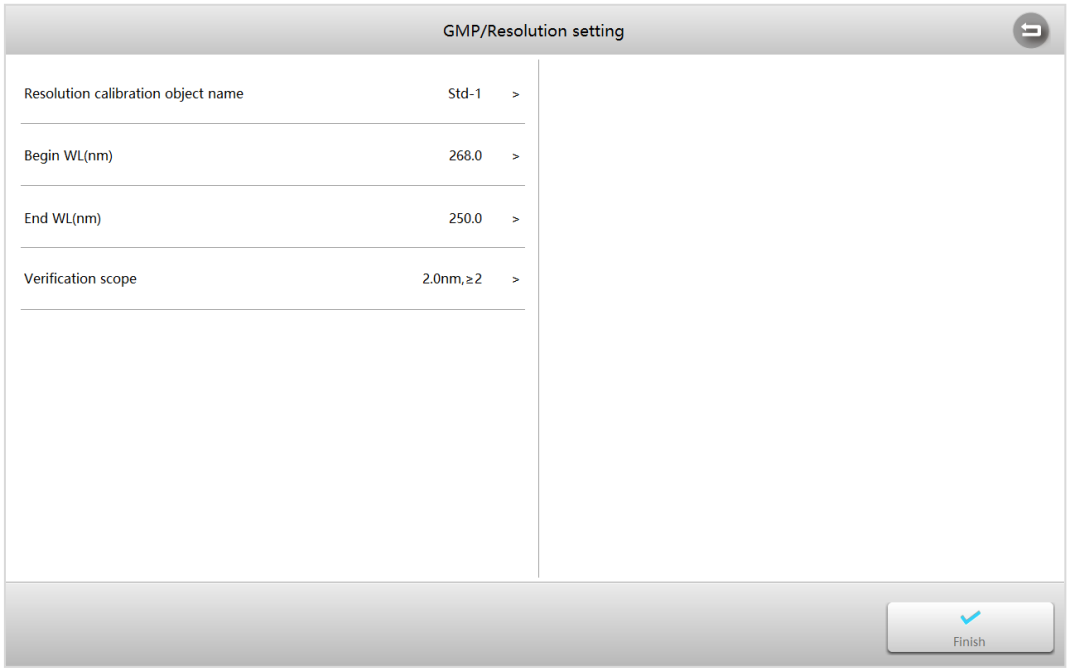
Resolution verification

Standard material

Toluene-hexane

Verification

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



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

3 According to the instructions of the instrument, put the reference into the measurement channel to do blank, then put the standard material into the measurement channel and display the test result after completion.

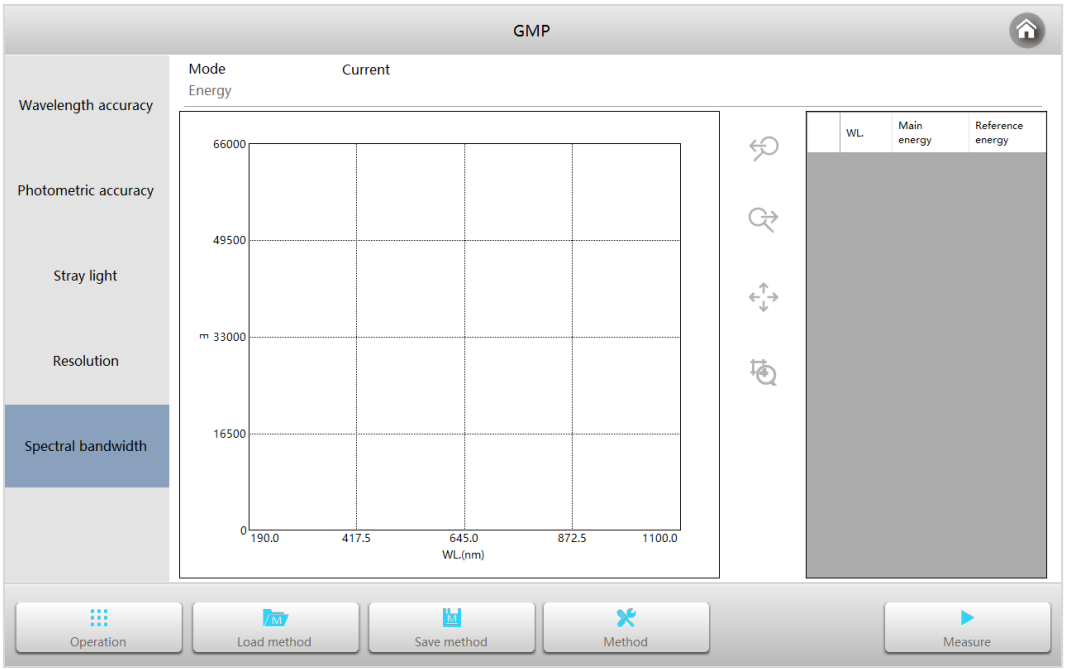
Spectral bandwidth verification

Standard material

Air

Verification

1 **Performance Verification** interface, press the tab **Spectral bandwidth**.



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

Troubleshooting

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

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

Dark Current Error when self-check	The lid of the compartment is open during self-check	Close the lid, restart
System Calibrate Failed	Something block the Light path	Remove it, calibrate again
Measurements inaccurate	Cuvettes were contaminated	Clean cuvettes
	Samples were contaminated	Improve samples
	Worse matching of the cuvettes	Improve the matching of the cuvettes
	Dark current error	Resample dark current

Repair and maintenance

Daily Maintain

Check the compartment

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

Surface clean

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

Clean the cuvettes

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

Spare Parts Replacement

Replace the fuse

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

1. **Tools preparation**

   Prepare a 3×75 Flat Blade screwdriver.

2. **Switch Off the power supply**
   Switch off the power supply, and unplug the socket.

3. **Take out the Fuse Seat**
   Push the fuse case by using the screwdriver, and turn it counter clockwise, the fuse seat will pop out when released.

4. **Replace a new fuse**
   Pick out the spare fuse (3.15A/250V) and replace it.

5. **Reset the fuse seat**
   Replace the fuse seat in the power socket. Push the fuse case by using the screwdriver, and turn it clockwise, the fuse seat will be locked when released.

6. **Switch on the power**
   Plug the socket and switch on the power.

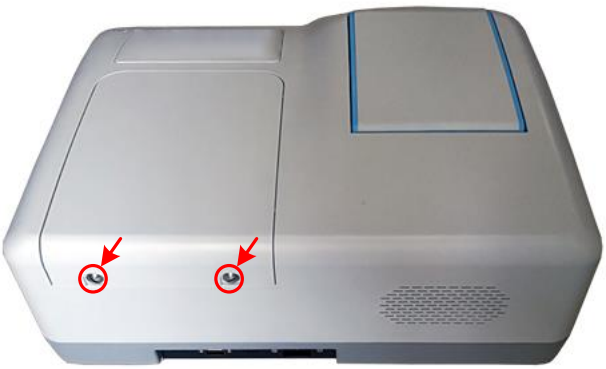
Replace lamps

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

1. **Tools preparation**
   Prepare a 6×150mm Flat Blade screwdriver and a pair of glove.

2. **Power Off**
   Switch off the power supply and unplug the socket.

3. **Open the cover**
   Loosen the indicated two screws and remove the lamp cover.



4. **Replace the D2 lamp**

Unplug the connector(No. 1) .Unscrew the 2 screws on the D2 Flange (No.2) and remove the D2 lamp. Draw on the cotton glove and replace a new lamp. Fix the 2 screws and plug the connector again.

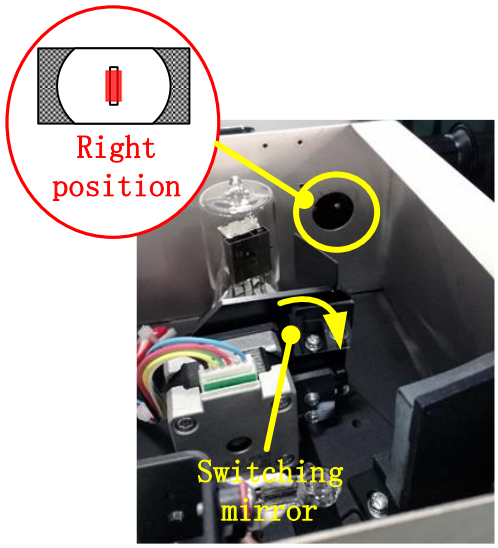
5. Replace W lamp

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

Pull out the defected W lamp and draw on the cotton glove. Insert the new W lamp as deep as possible on the lamp seat.

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

Switch on the power(the Switch Mirror should be placed to the position as indicates). Observe the entrance facular, and it should in the center of the entrance hole. If the facular deviate to Left or Right, then loosen the two screws and move the lamp seat to Left or Right until it focus on the center of the slot. Then fix the screws.



7. **Finish**

Reset the cover of the light chamber and fix the screws. Reset the cover of the lamp room and fix the screws

User replaceable accessories and spare parts

Description	Quantity	Cat. No.
CELL HOLDER, 4-CELL, 10MM	1PC	634-6003
CELL HOLDER, 4-CELL,10 TO 50MM	1PC	634-6004
CELL HOLDER, 4-CELL, 10 TO 100MM	1PC	634-6005
CELL HOLDER, FOR CYLINDRICAL CELL	1PC	634-6006
CELL HOLDER FOR TEST TUBES	1PC	634-6009
CELL HOLDER, WATER-JACKETED, 1 CELL, 10MM	1PC	634-1135
CELL HOLDER FOR MICRO CELLS,BEAM HEIGHT:15MM	1PC	634-0687
CELL HOLDER FOR TEST TUBES, D=16mm	1PC	634-1133
CELL HOLDER,5-POSITION AUTO CELL CHANGER, 10 TO	1PC	634-1136

100MM		
CELL HOLDER,8-POSITION AUTO CELL CHANGER, 10MM	1PC	634-6010
CELL HOLDER, SOLID SAMPLE	1PC	634-6011
CELL HOLDER, WATER-JACKED, 4 CELL, 10MM	1PC	634-1134
CUVETTE, SQUARE.GLASS,10MM	4PCS	634-6013
CUVETTE, SQUARE.GLASS,20MM	2PCS	634-6014
CUVETTE, SQUARE.GLASS,30MM	2PCS	634-6015
CUVETTE, SQUARE.GLASS,50MM	2PCS	634-6016
CUVETTE, SQUARE.GLASS,100MM	1PC	634-6017
CUVETTE, SQUARE.QUARTZ,10MM	2PCS	634-6018
CUVETTE, SQUARE.QUARTZ,20MM	2PCS	634-6019
CUVETTE, SQUARE.QUARTZ,30MM	2PCS	634-6020
CUVETTE, SQUARE.QUARTZ,50MM	2PCS	634-6021
CUVETTE, SQUARE.QUARTZ,100MM	1PC	634-6022
CELL,QUARTZ, 100UL, 10MM, BEAM HEIGHT:15MM	1PC	634-0688
CELL,QUARTZ, 200UL, 10MM, BEAM HEIGHT:15MM	1PC	634-0689
CELL,QUARTZ, 500UL, 10MM	1PC	634-6025
FLOW CELL, 5 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0690
FLOW CELL, 10 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0691
FLOW CELL, 20 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0692
FLOW CELL, 30 MM, GLASS, BEAM HEIGHT:15MM	1PC	634-0693
FLOW CELL, 5 MM, QUARTZ, BEAM HEIGHT:15MM	1PC	634-0694
FLOW CELL, 10 MM, QUARTZ, BEAM HEIGHT:15MM	1PC	634-0695
FLOW CELL, 20 MM, QUARTZ, BEAM HEIGHT:15MM	1PC	634-0696
FLOW CELL, 30 MM, QUARTZ, BEAM HEIGHT:15MM	1PC	634-0697
PELTIER UNIT, A-1101	1PC	634-1138
SIPPER UNIT WITHOUT TEMP. CONTROL, A-1001	1PC	634-1139
SIPPER UNIT WITH PELTIER TEMP. CONTROL, A-1201	1PC	634-1140
SAMPLE ROOM PANEL WITH PORT	1PC	634-1143
FUSE, 3.15A/250V	1PC	634-0651
SOFTWARE STANDARD	1PC	634-1182
SOFTWARE AUDIT TRAIL	1PC	634-1183

Technical service

Web Resources

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

• Complete technical service contact information

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

• Additional product information and special offers

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

Warranty

VWR warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. 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.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, 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.

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

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

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

Thank you

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