Instruction manual

VWR® P9 UV/VIS Double Beam Spectrophotometer

EU cat. no 634-1231



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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.



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 danger zone.
- Do not use the device if it is damaged, especially if the main power cable 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.

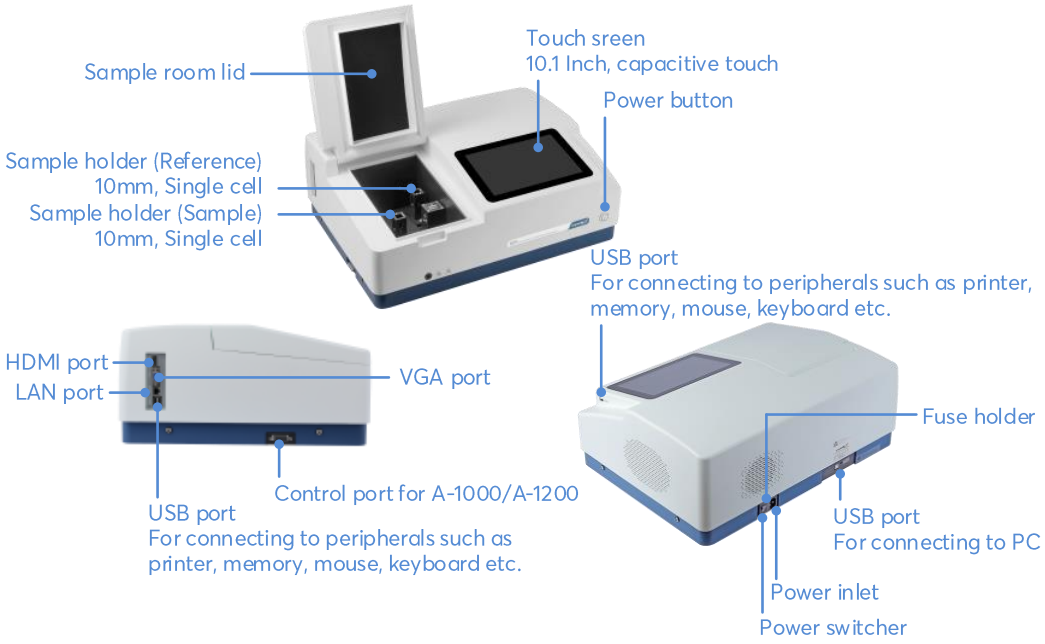
Package Contents

Description	Quantity
Spectrophotometer	1PC
Cuvette, Square.Glass, 10mm (634-6013)	4PCS
Cuvette, Square.Quartz, 10mm (634-6018)	2PCS
Power Cord (Euro/UK/CH Plug)	3PCS
VWR® UVStudio Standard Software USB Flash Drive	1PC
USB Cable	1PC
Quick Manual	1PC
Dust Cover	1PC

Unpacking

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

Appearance



Installation

Placement

Carefully place the instrument on a stable workbench.

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.

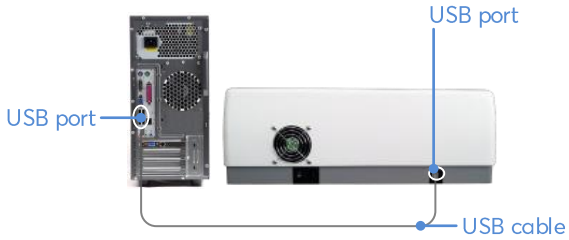
Connect the power cord

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.



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).



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	Double Beam
Wavelength Range	190-1100nm
Band Width	0.5/1/2/4/5nm
Stray Light	≤0.03%T @ 220nm & 360nm
Photometric Range	0 to 200%T, -0.3 to 3.0A, 0 to 9999C
Wavelength Accuracy	±0.3nm
Photometric Accuracy	±0.3%T or ±0.004A @ 1A
Stability	0.0003A/h @ 500nm(After warming up for 1 hour)
Baseline Flatness	±0.0005A
Language	English, French, German, Spanish, Portuguese, Chinese
Display	TFT Color LCD (10.1", Touch Screen)
Storage	64GB
Interface	USB-A, USB-B, Ethernet, VGA, HDMI
Measuring Procedure	Photometry, Multi-wavelength, Kinetics, Time Scanning, Quantitation, Spectrum, Nucleic Acid/Protein
Power Supply	AC 100~240V, 50~60 Hz, 140W
Dimension	580mm×420mm×235mm
Weight	18kg
Work Environment	15 to 35°C, 15 to 70% relative humidity
Store Environment	-10 to 50°C, 15 to 70% relative humidity

This instrument is compliant to the 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 amendments.

Overview

P9 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.

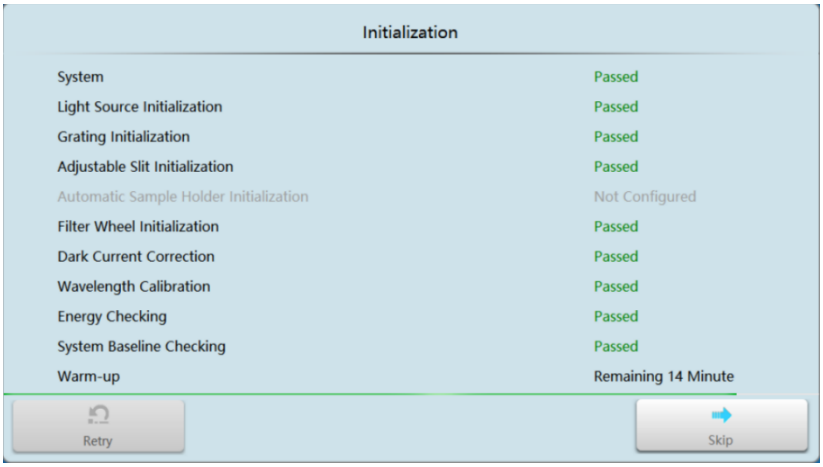
Turn the instrument power on/off

Switch on the power on the back of the instrument. Press the blue button 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 UVStudio after double-clicking the icon on the windows desktop. The instrument starts self-check. Self-check includes the following steps: Turn on lamp and positioning light source → positioning grating → positioning adjustable slit → positioning automatic sample holder (If installed.) → positioning filter wheel→ correct dark current → calibrate wavelength → checking energy → checking system baseline.



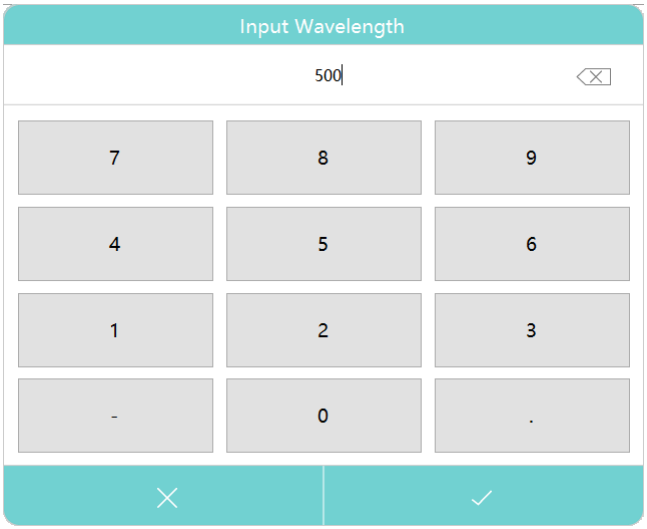
General Operating Instructions

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.

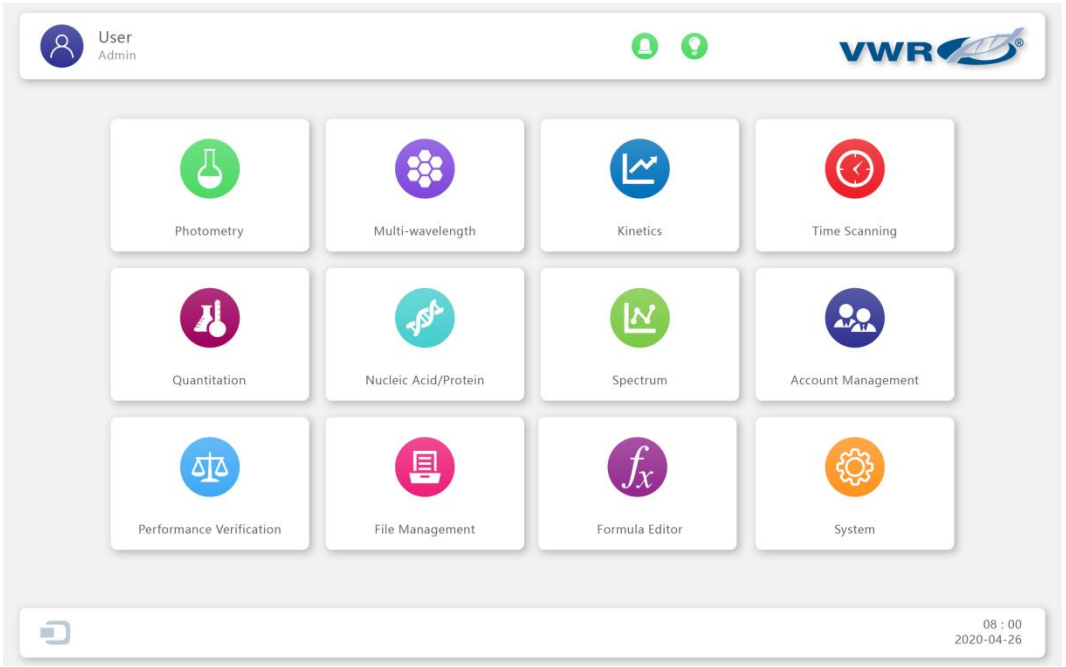




Basic Operation

Enter an application module

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



	Photometry Measures the photometric value of a sample at a single wavelength.
	Multi-wavelength Measures the photometric value of a sample at multiple wavelengths.
	Kinetics Measures the change in absorbance or absorbance change rate over time at a specified wavelength.
	Time Scanning Measures the change of photometric value with time at a single wavelength.
	Quantitation Establish a standard curve and measures the concentration of the sample using a standard curve.
	Nucleic Acid/Protein Measures DNA, RNA and protein concentrations using built-in methods or new methods.
	Spectrum Measures the photometric curve of a sample over a range of spectra.

	**Account Management (Only For Audit Trail Edition)** 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.
	**Formula Editor** Users can add calculation formula 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.

Measure samples

Measurement interface, put "Sample" in measurement channel, press  to measure samples.

Enter data /curve list

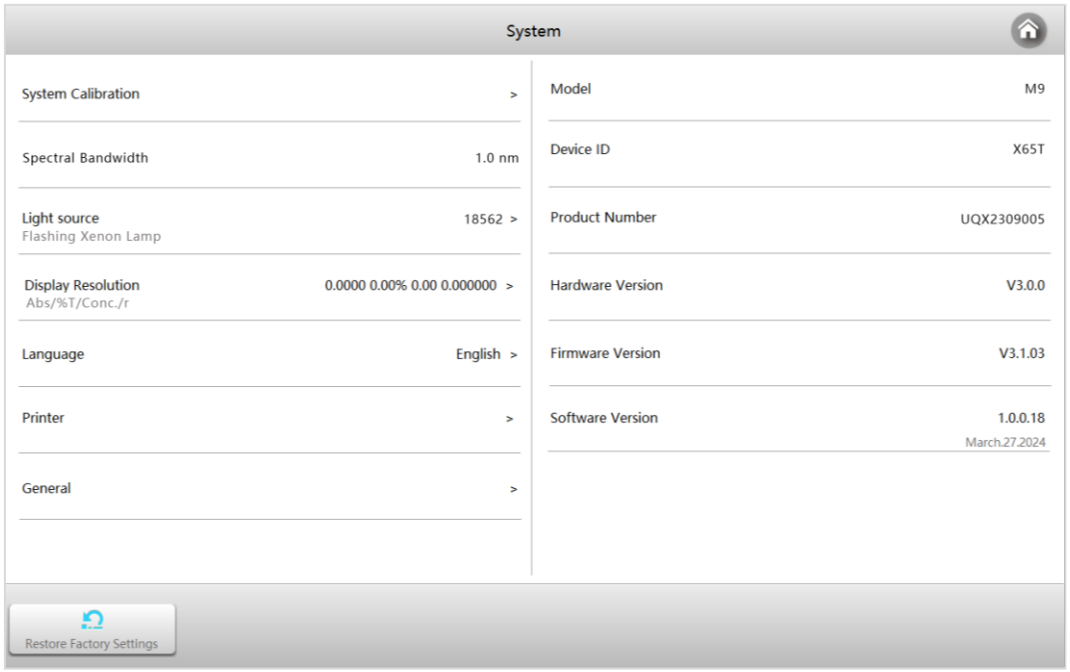
Measurement interface, press  to enter data/curve list.

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

Calibration and System Settings

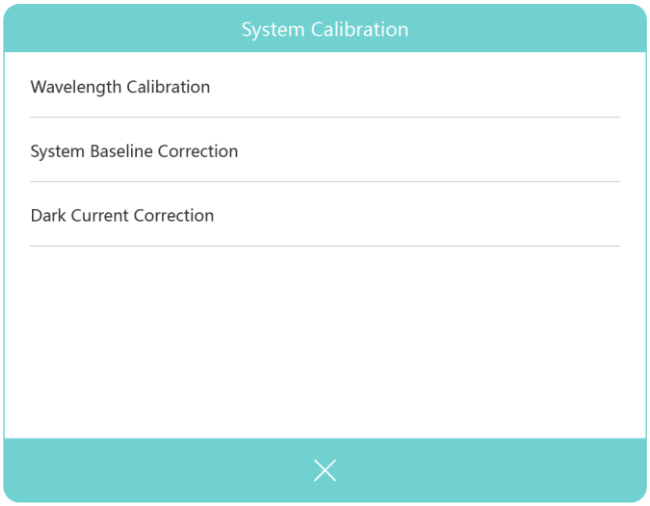
Select the icon  in the main interface. Display options to calibrate the system and configure the basic instrument settings.



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.

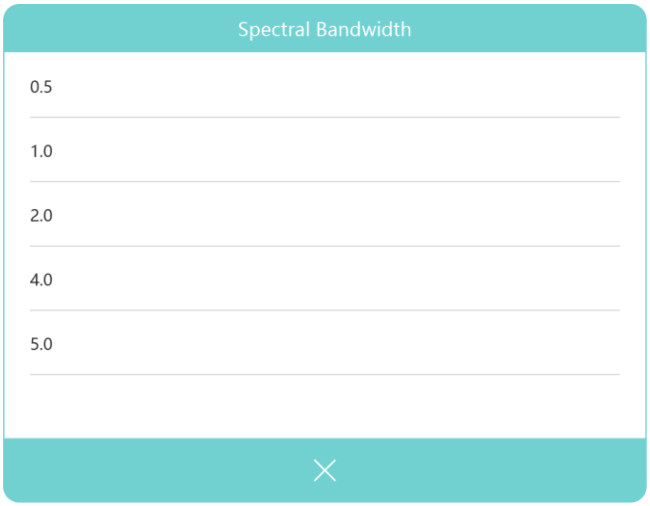
Important *Before performing the calibration, you must remove something from the measurement channel, close the sample chamber cover, and maintain this state throughout the calibration process.*



Change Bandwidth

Select the tab **Bandwidth** in the System interface. Select the bandwidth which you want.

Important ***After changed the bandwidth, you must do a calibration (Wavelength calibration, System baseline calibration and Dark current calibration .) .***



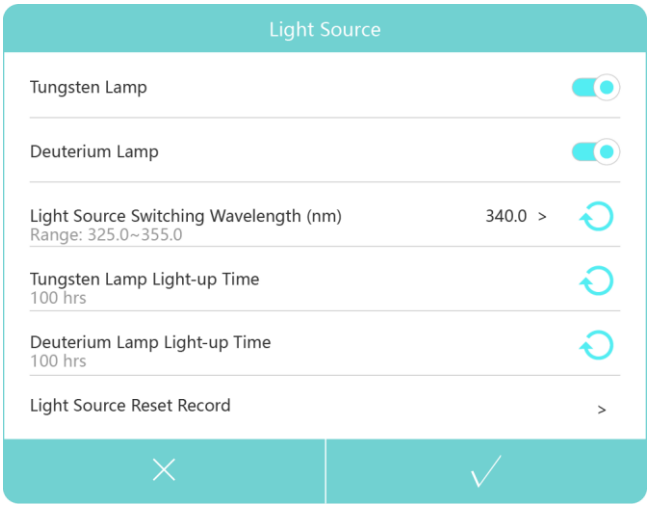
Display resolution setting

Press the tab **Display 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**

  Click  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.

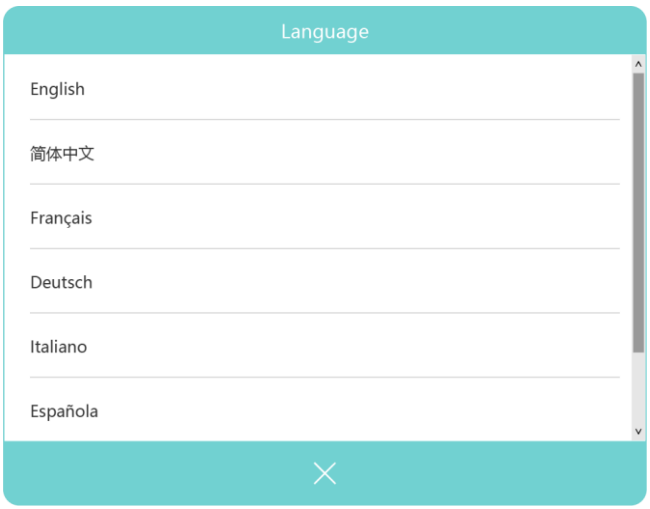
Note *After modifying the light source switching wavelength, you need to calibrate system baseline.*

Click  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.*

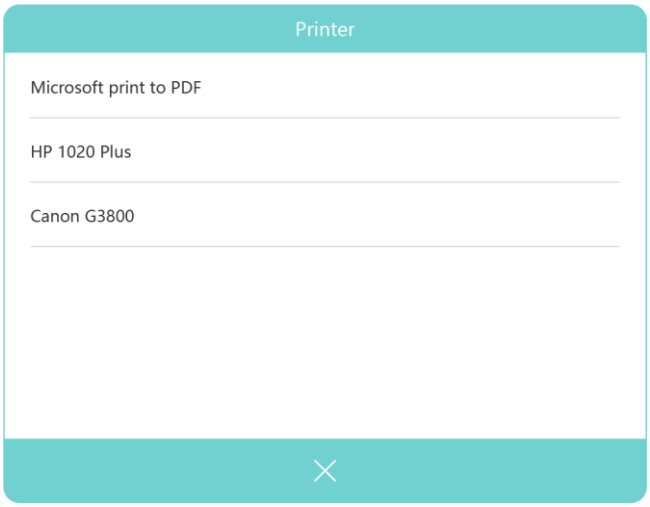
Language setting

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



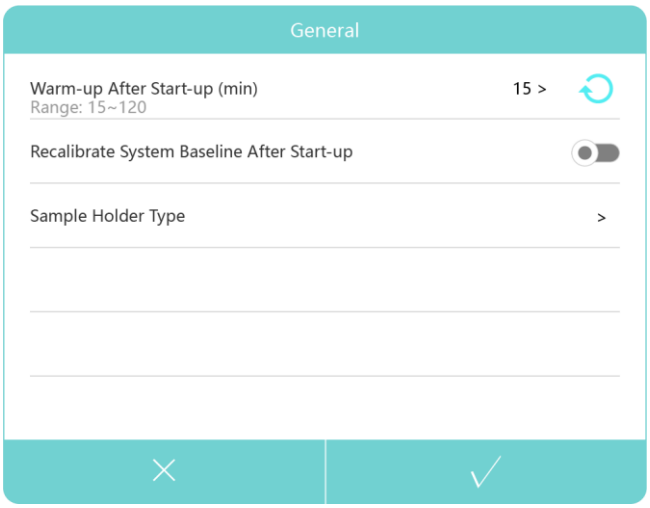
Printer setting

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



General settings

Click the tab **General** to enter.



- **Warm up**
  Click "Warm up After Start-up (min)" , pop up numeric keyboard, input value 15~120 minutes.
- **Calibrate system baseline when startup**

Click the icon  to turn on/off the "Calibrate System Baseline After Start-up" option.

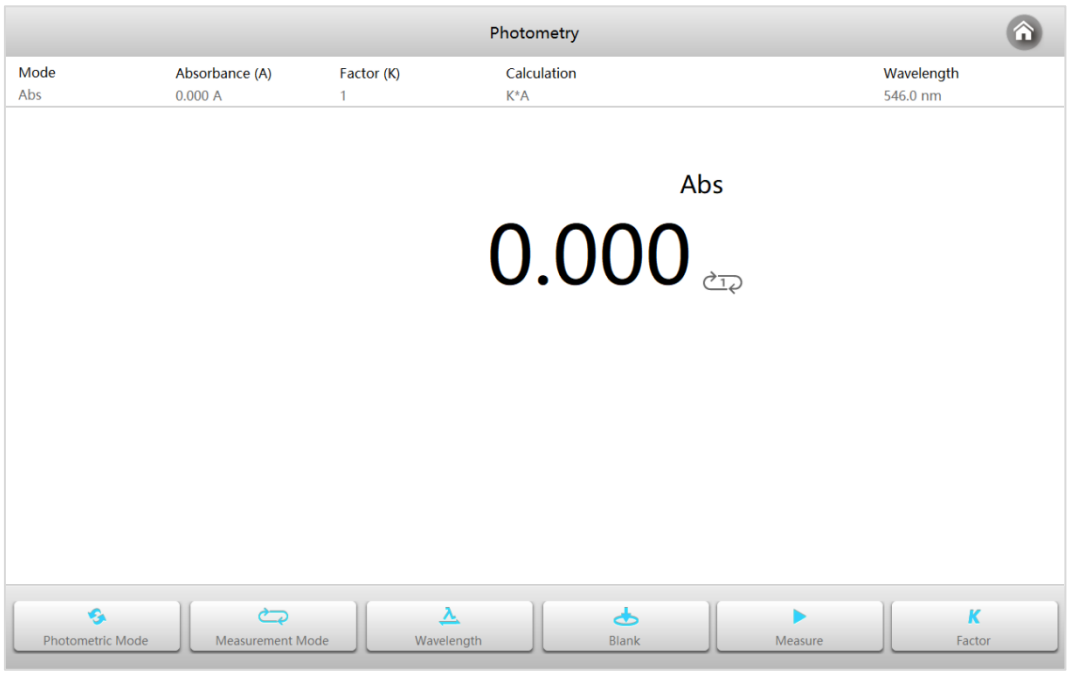
- **Set sample holder type**
  If you change to an auto sample holder or micro volume test base, you will need to set the sample holder to the matching type.

Measurement

Photometry

Photometry mode is used to measure the absorbance or transmissivity of the sample at a single wavelength.

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



1 Click 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 Click the button to set wavelength, key in the measurement wavelength.

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

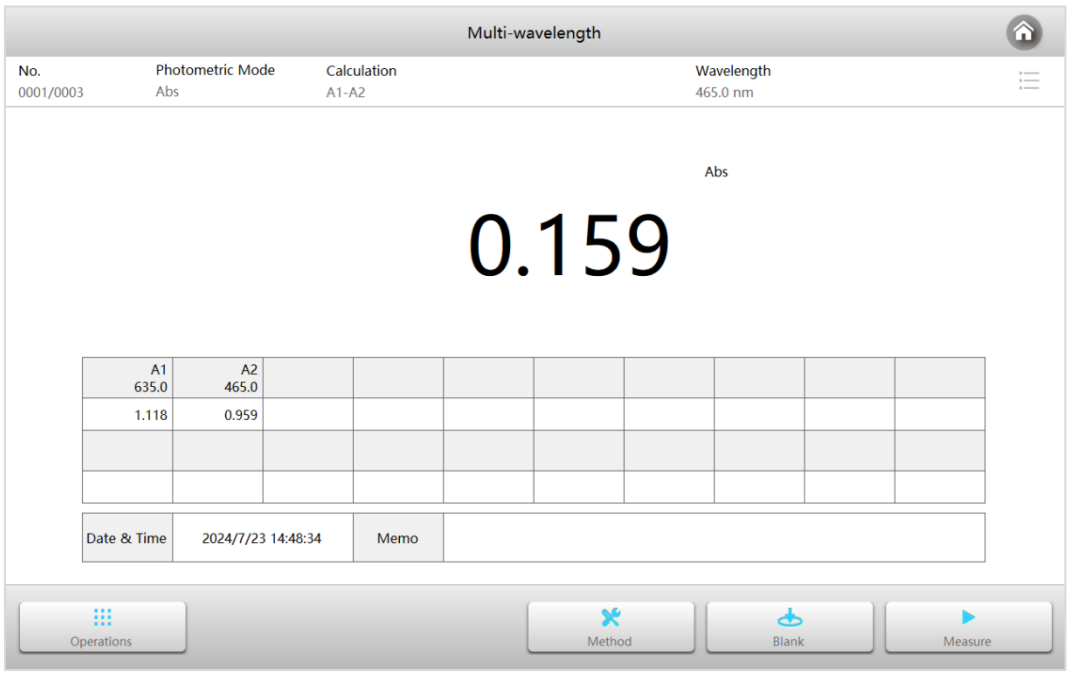
4 Put the reference in the measurement channel, click the button to do blank.

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

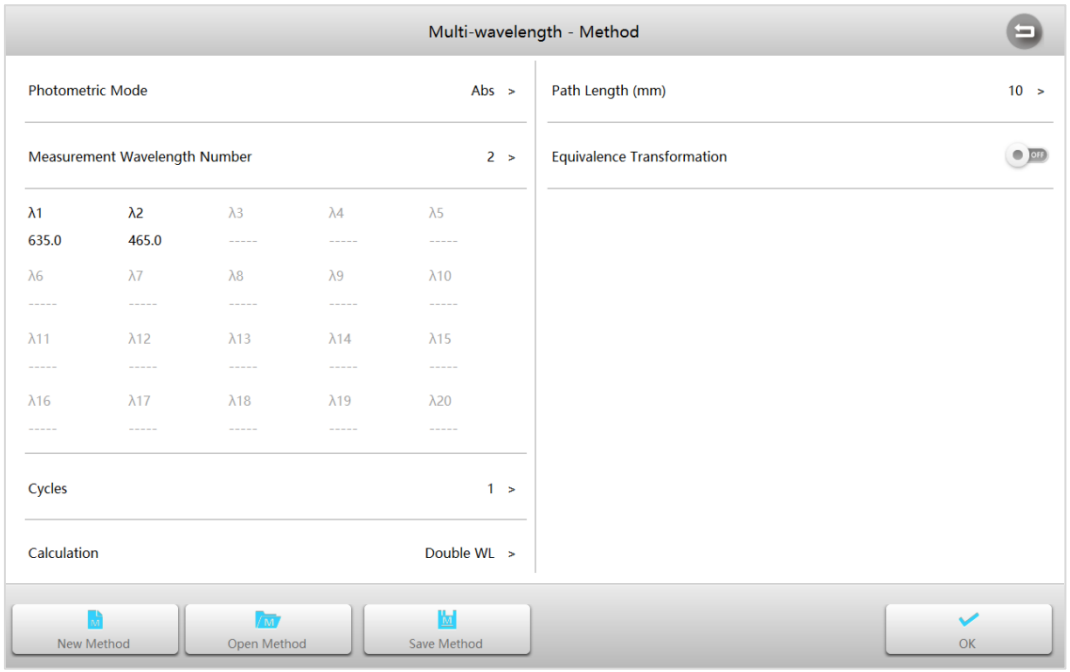
Multi-wavelength

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

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



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



Photometric mode	2 photometric modes: absorbance, transmittance.
Measurement Wavelength Number	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	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).
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.

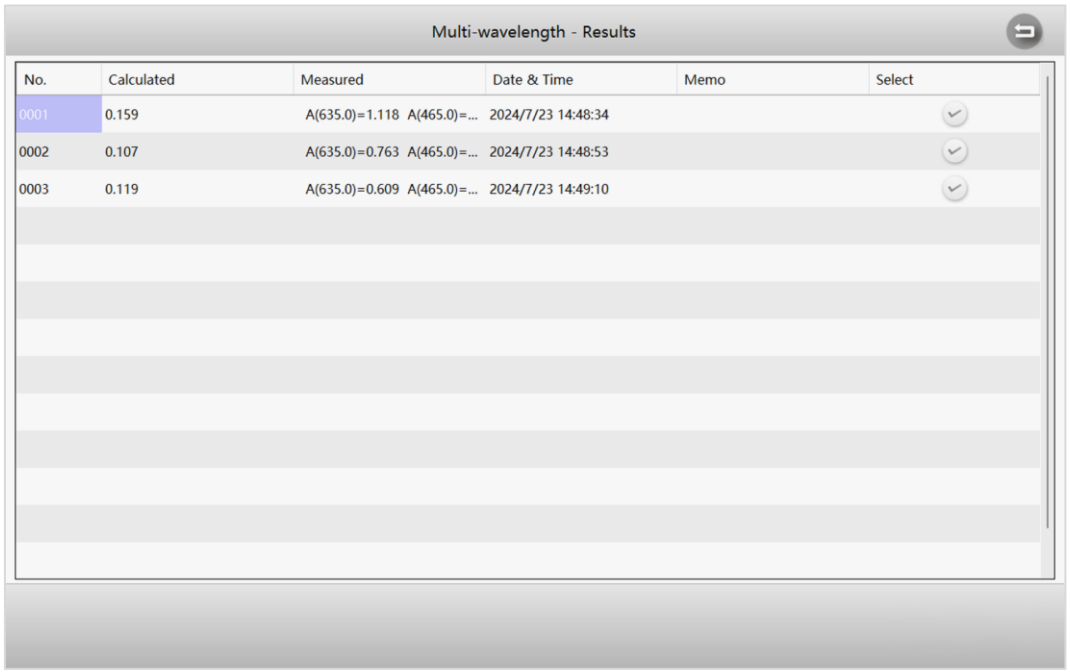
2 Put the reference in the measurement channel, close the sample chamber cover, and click

the button  to do blank.

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

4 Repeat step 3 to measure more samples.

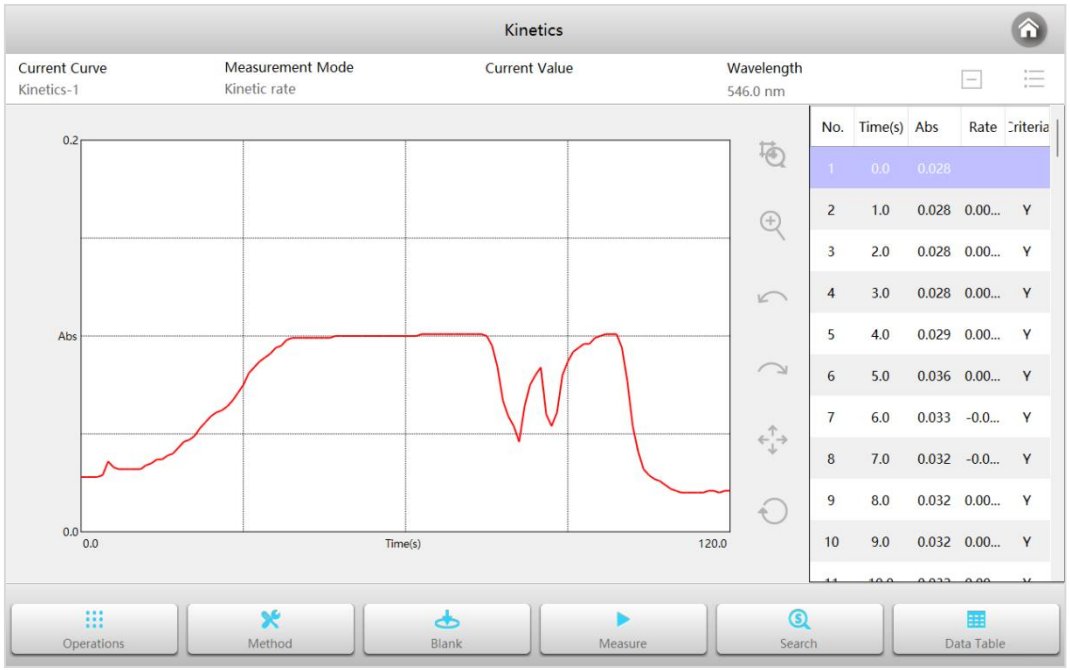
5 Click  to switch to list mode to browse the list of measurement results.



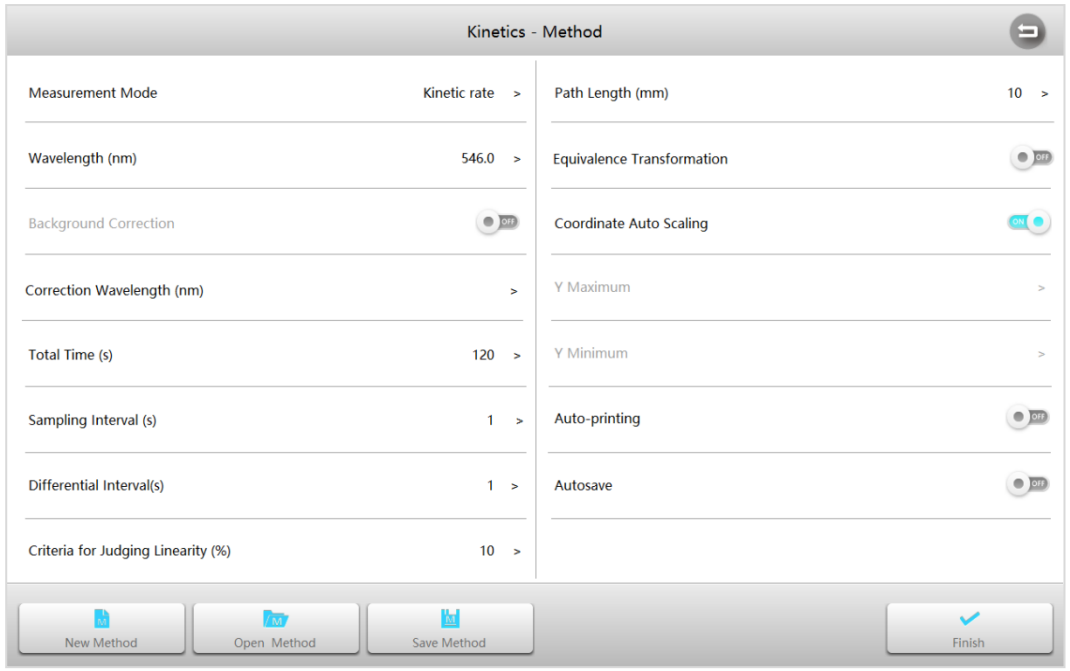
Kinetics

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

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



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



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.
Correction wavelength	Background corrected wavelength, range: 190~1100nm.
Total Time	Measure the total sampling time required.
Sampling Interval	Sampling interval.
Delay/Derivative	Waiting time before starting sampling/time of participating activity calculation.
Coefficient	Coefficient of activity calculation equation.
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Coordinate Auto Scaling	Whether to automatically adjust the coordinates based on the data.
Y Maximum	The maximum value of the ordinate (valid only when the coordinates are fixed).
Y minimum	Minimum value of the ordinate (valid only when the coordinates are fixed).
Auto-printing	Automatically print curves and results after measurement is complete.
Autosave	Automatically save curves and results after measurement is complete.

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

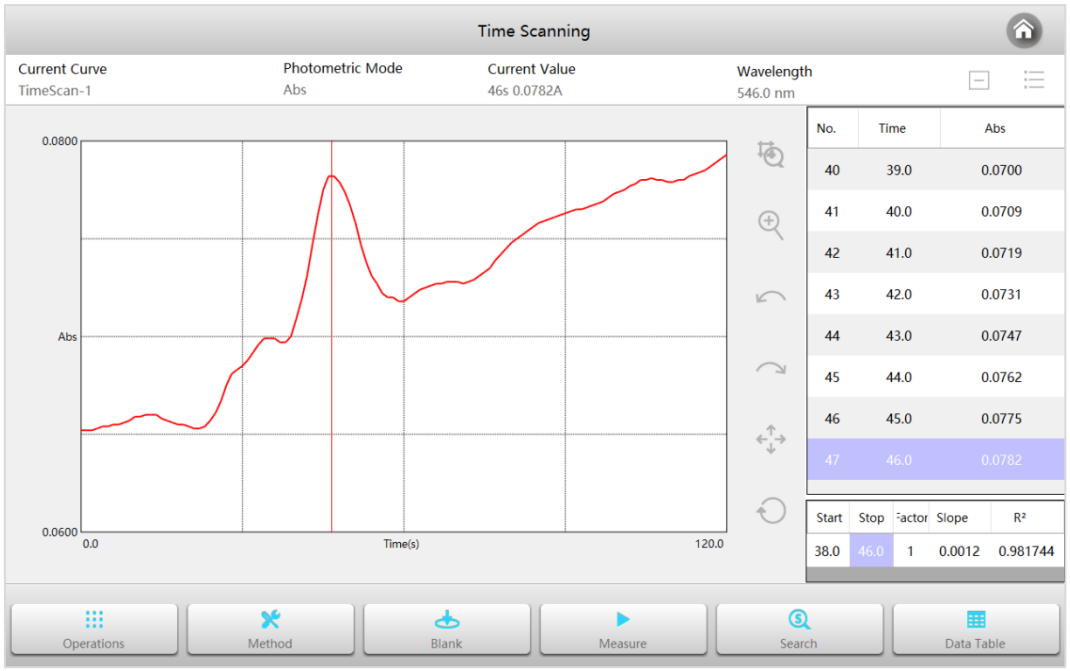
3 Put the sample in the measurement channel, close the sample chamber cover, and click the button  to measure and get sampled data and draw the curve.

4 Repeat step 3 to measure more samples.

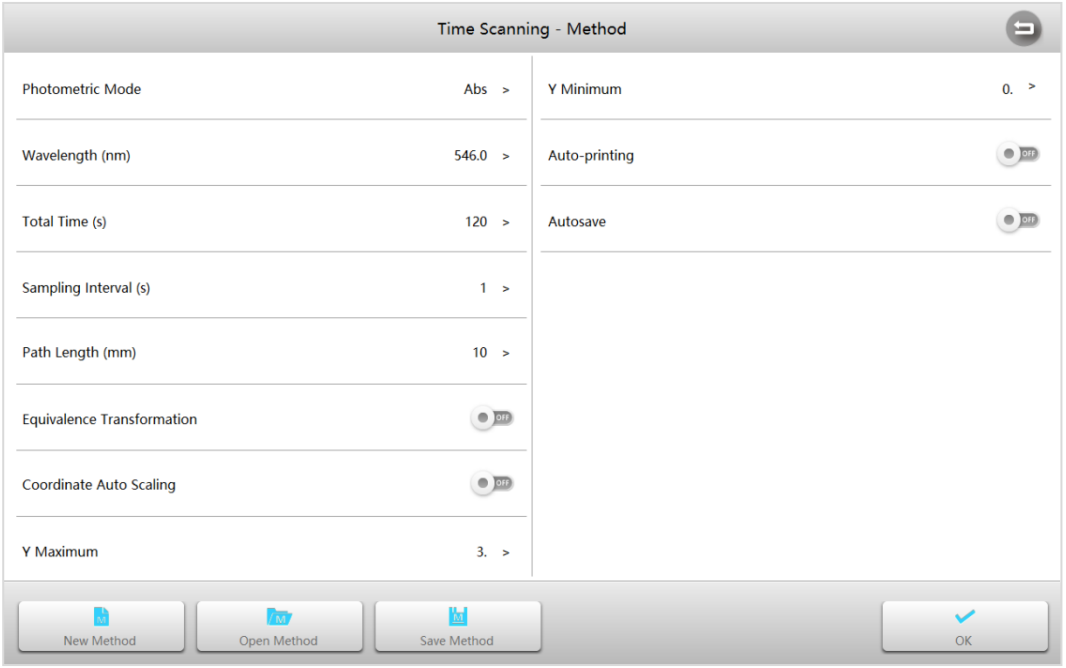
Time scanning

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

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



1 **Time scanning measurement** interface, click the button  to set the measurement parameters. The method can be saved or directly called from the memory. Click  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.
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Coordinate Auto Scaling	Whether to automatically adjust the coordinates based on the data.
Y Maximum	The maximum value of the ordinate (valid only when the coordinates are fixed).
Y minimum	Minimum value of the ordinate (valid only when the coordinates are fixed).
Auto-printing	Automatically print curves and results after measurement is complete.
Autosave	Automatically save curves and results after measurement is complete.

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

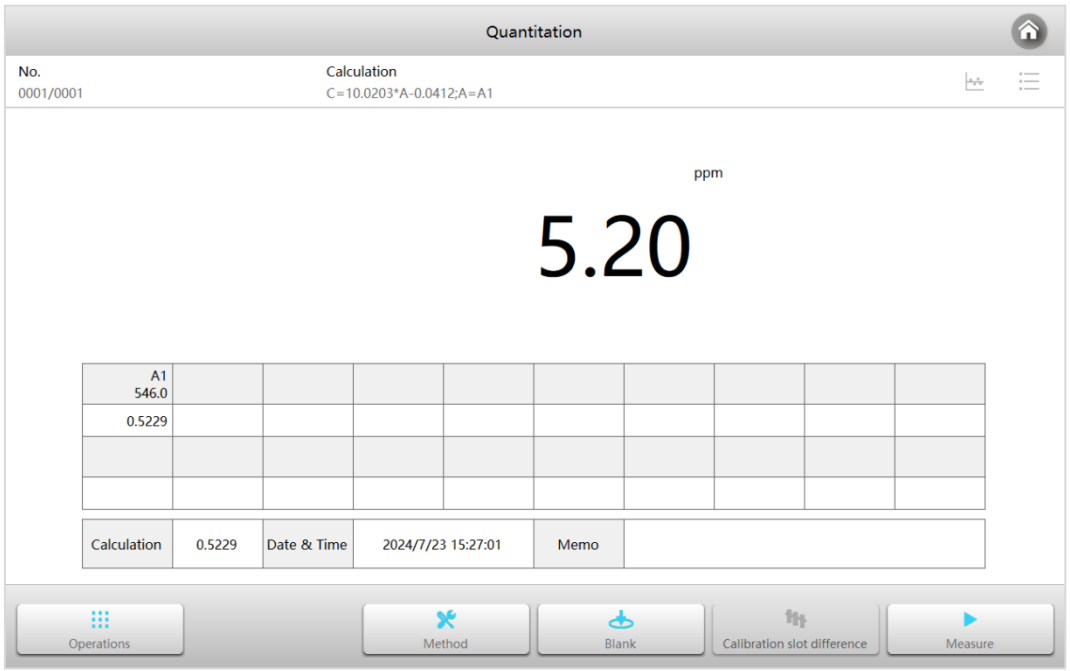
3 Put the sample in the measurement channel, close the sample chamber cover, and click the button to measure and get sampled data and draw the curve.

4 Repeat step 3 to measure more samples.

Quantitation

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

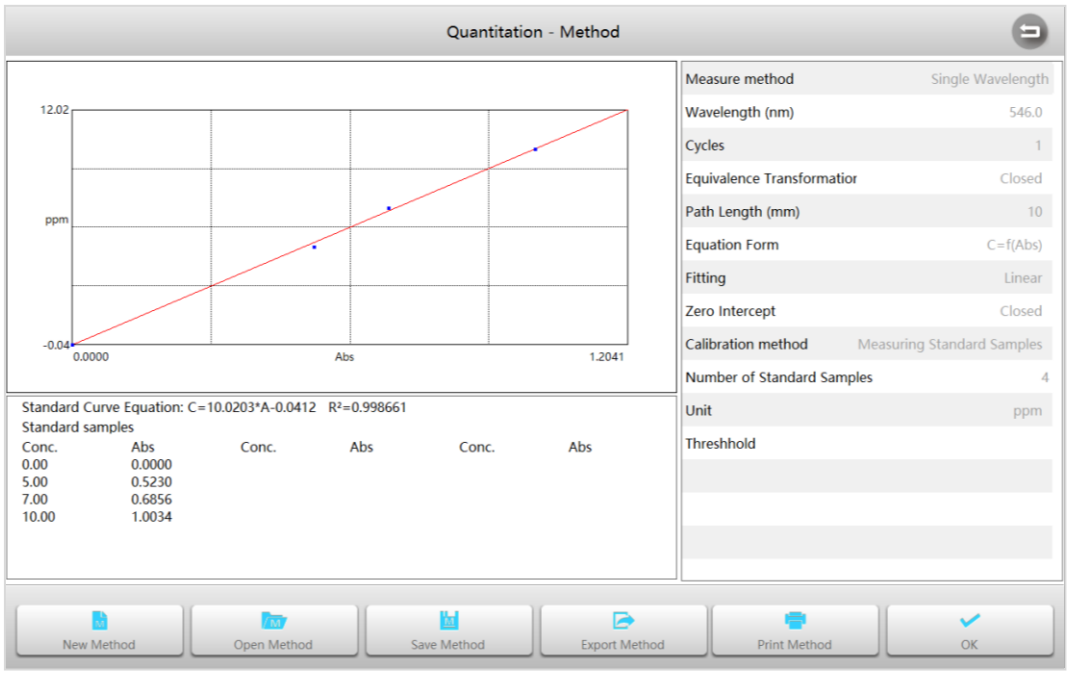
Main interface, click the icon to start a **Quantitation** application.



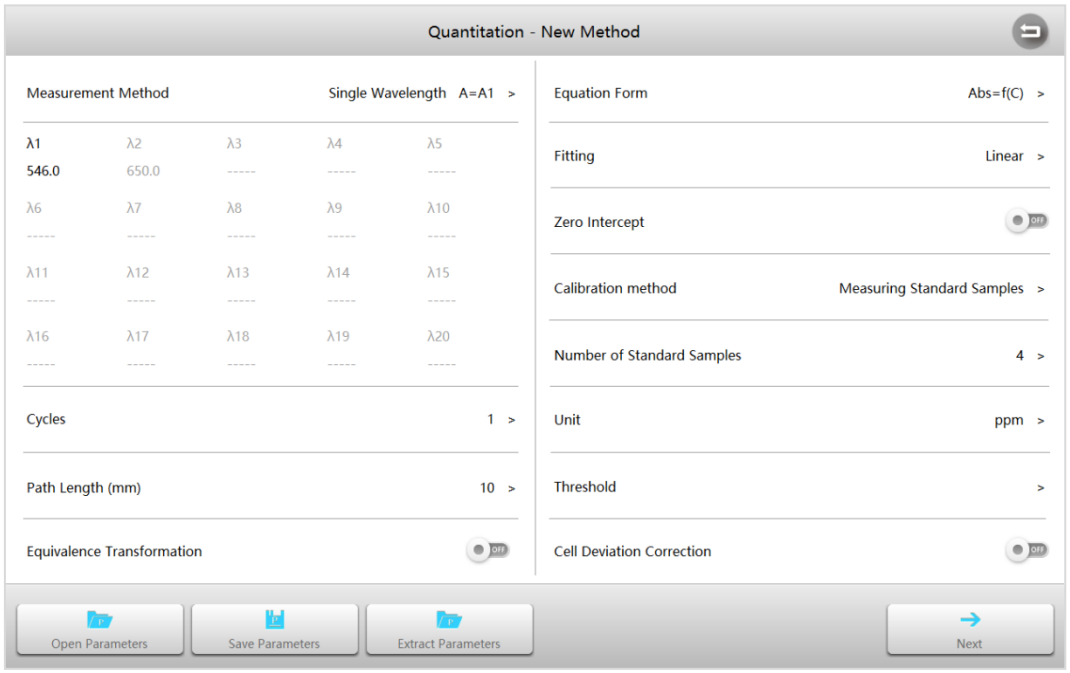
Establish quantitative methods

1 **Quantitation measurement** interface, click the button to enter into **Method**

interface.



2 **Method** interface, click 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	Measured 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.
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Equation Form	Equation form: C=F(Abs) and Abs=F(C).
Fitting	Three ways of fitting are provided: Linear, Quadratic, Cubic.
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 Method	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,

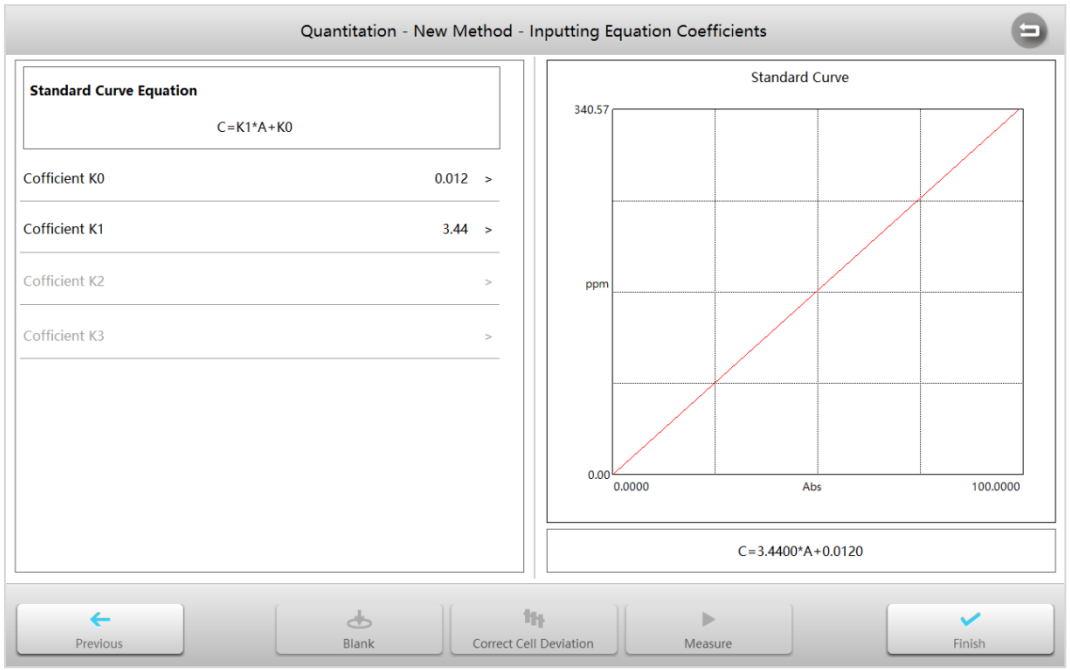
	mg/l, μg/l, ng/l, g/dl, mg/dl, μg/dl, mg/ml, μg/ml , ng/ml, μg/μl, ng/μl, mol/l, mmol/l, IU, and support input custom units.
Number of standard samples	The number of standard samples can be selected (only valid for standard sample calibration and standard sample input), quantity: 2~20.
Threshold	Upper 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 click the button → to start.

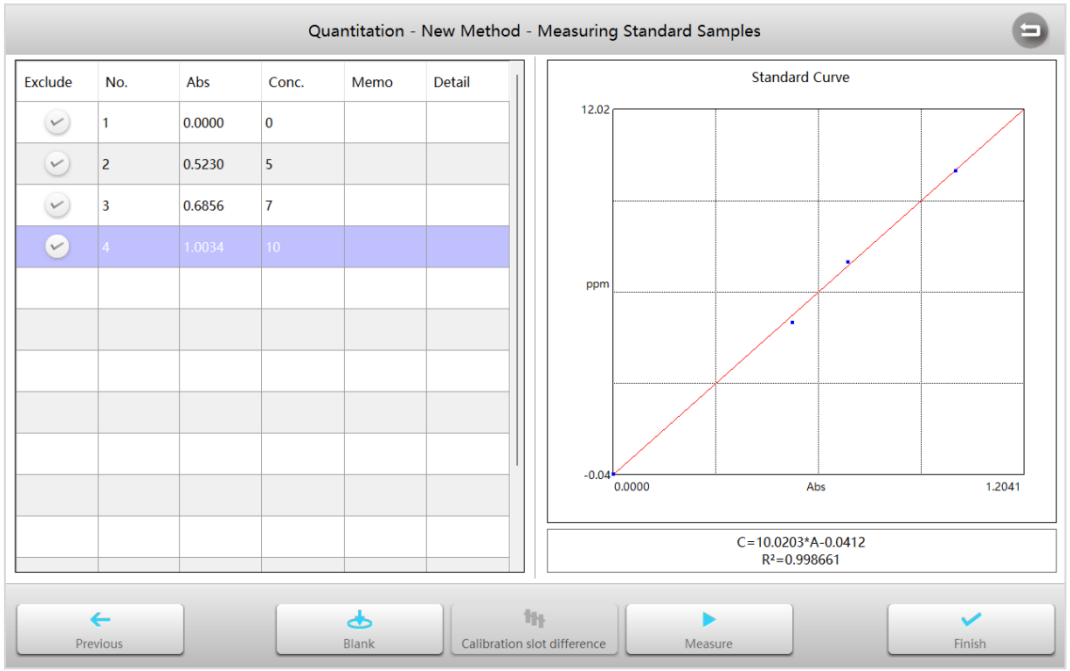
2) **Input Equation Coefficient** interface, click the coefficient K0~Kn to pop up the keyboard and enter the coefficient.



3) After the method is completed, the standard curve and related information are displayed. Click 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 click the button to start.



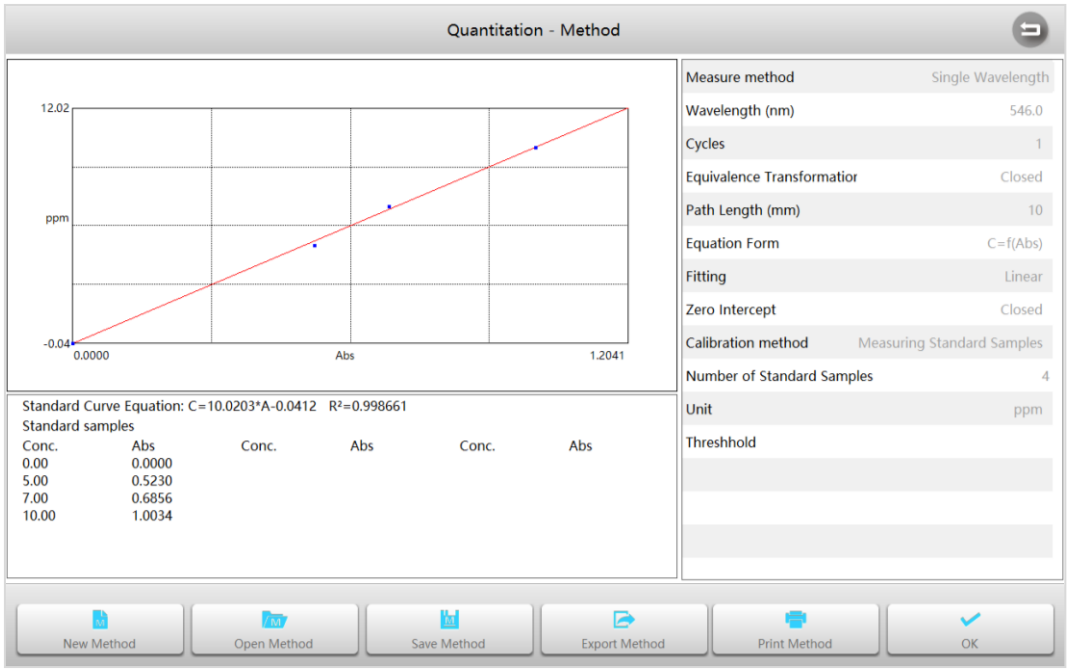
2) **Measure standard sample** interface, put the reference in the measurement channel, close the sample chamber cover, and click the button to do blank.

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

4) Repeat step 3 to measure all standard samples.

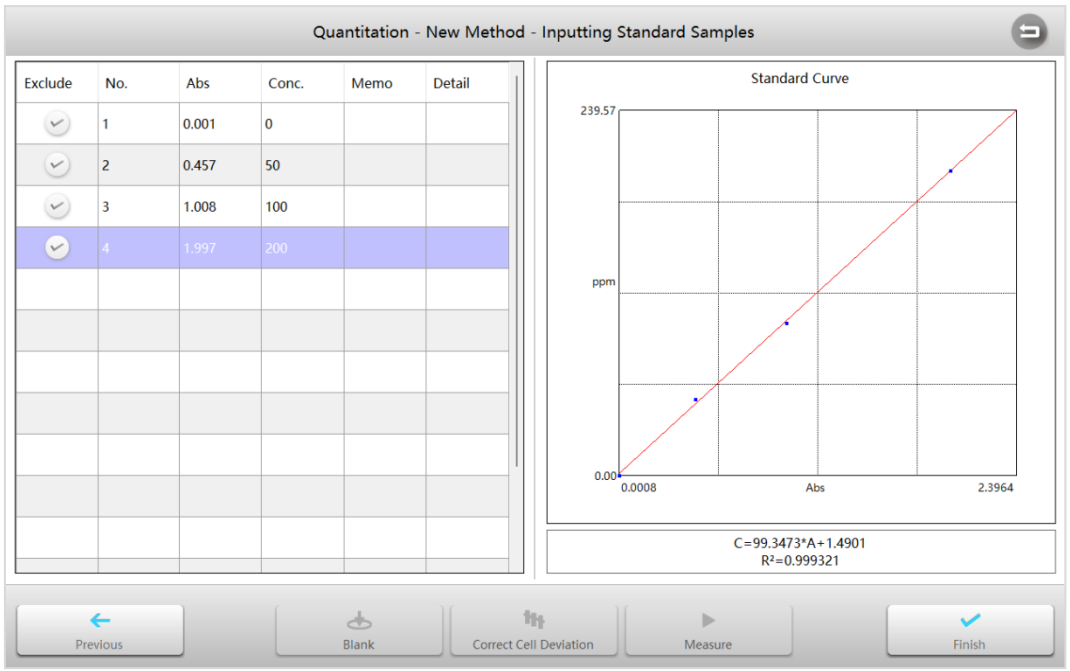
5) Click the concentration cell to enter the corresponding concentration value.

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



3.3 Establish standard curve by measuring standard samples

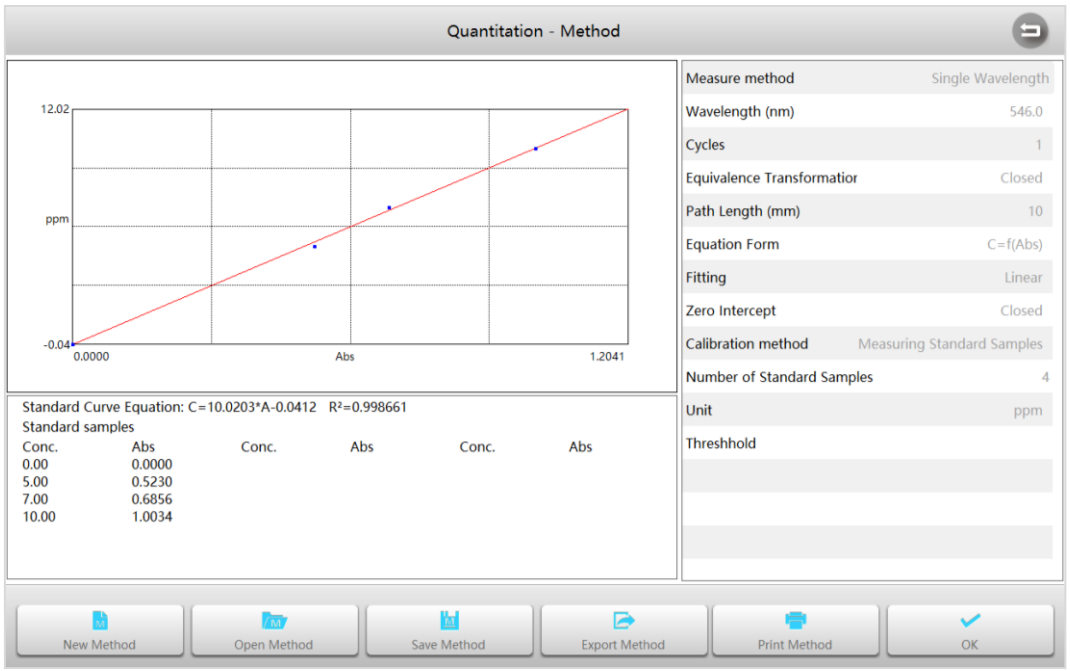
1) Set **Calibration** to **Input standard samples**, set other measurement parameters according to measurement requirements, and click the button → to start.



2) Click the **Abs** cell to input Abs value and click **Concentration** cell to input the

corresponding concentration value.

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



Measure sample

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

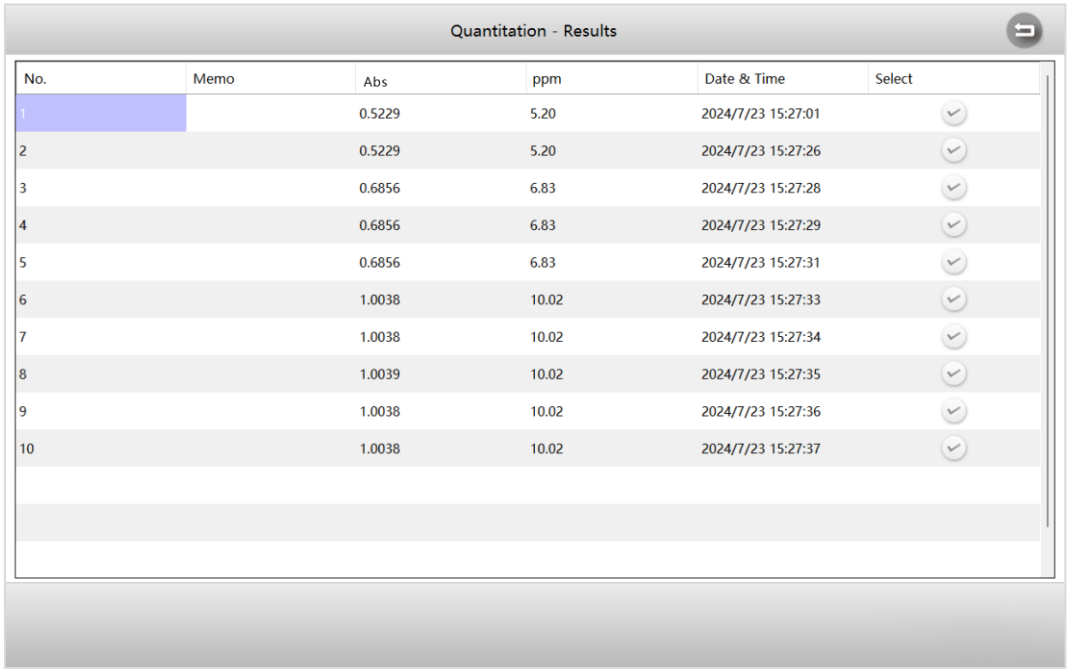
2 **Method** interface, load or new a method, click the button to accept and return to measurement interface.

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

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

5 Repeat step 4 to measure more samples.

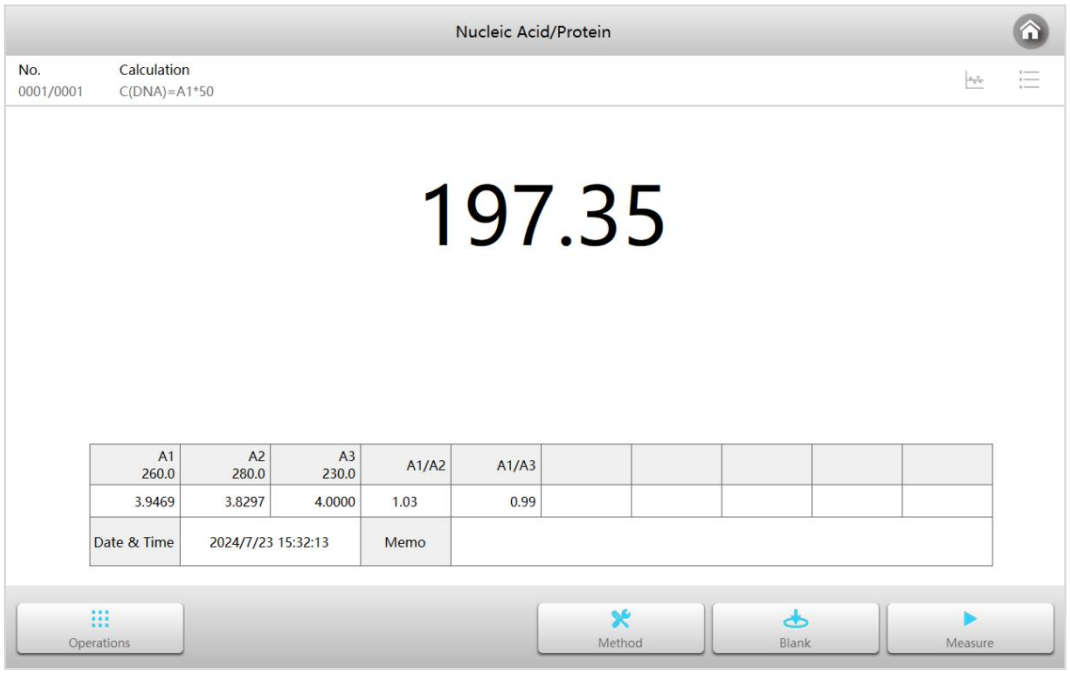
6 Click to switch to list mode to browse the list of measurement results.



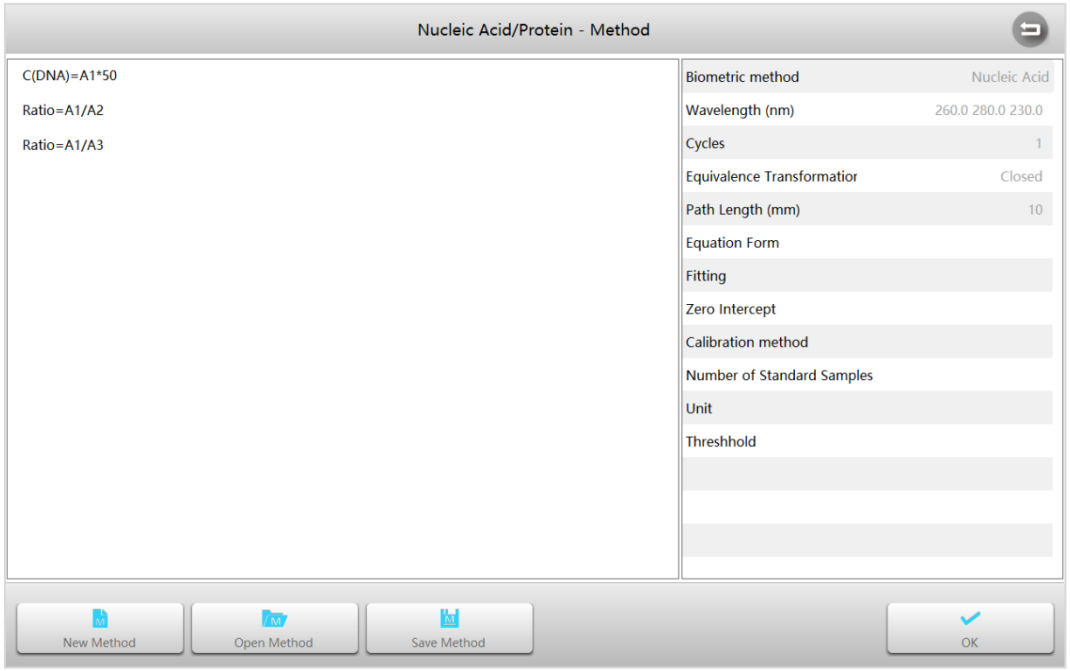
Nucleic Acid/Protein

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

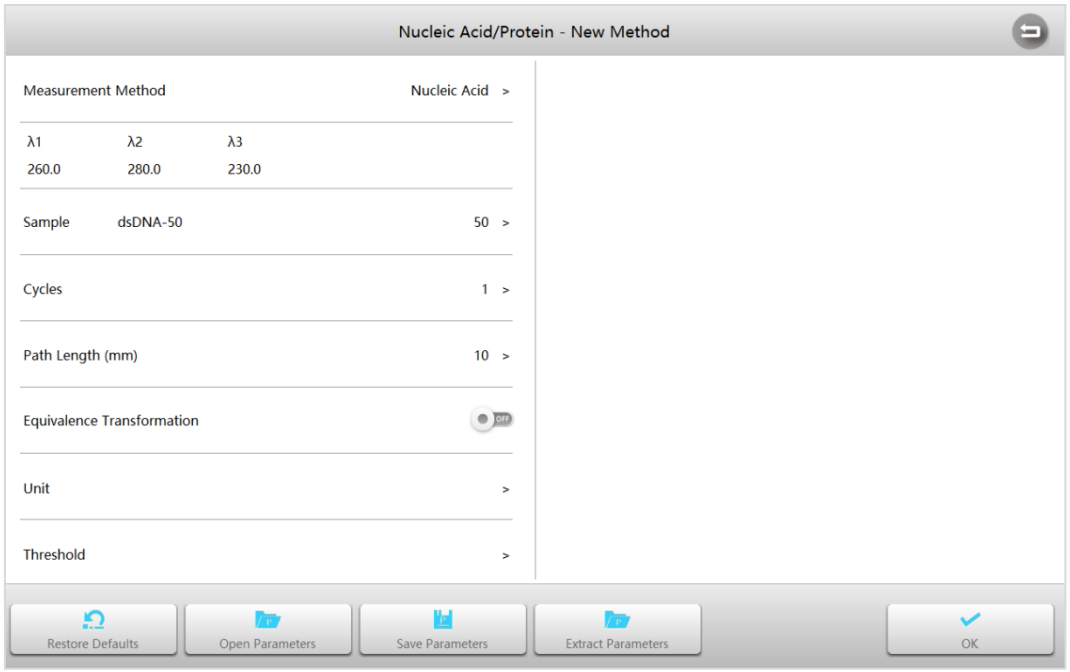
Main interface, click the icon to start a **Nucleic Acid/Protein** measurement application.



1 **Nucleic Acid/Protein** measurement interface, click the button to enter into **Method** interface.



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



Measurement Method	Built-in Nucleic Acid (dsDNA, ssDNA, RNA), Protein A-280 (1Abs=1mg/mL, BSA, IgG, Lysozyme), DNA Quantitation 1 (260/280), DNA Quantitation 2 (260/230), Protein-Lowry, Protein-BCA, Protein-CBB, Protein-Biuret measurement method.
Wavelength	Measured wavelength, range: 190~1100nm.
Sample	Sample type, dsDNA, ssDNA, RNA, Protein, etc.
Cycles	1, 2, 3, 5, 10, 20, 30, 50 times can be selected, the instrument will calculate the average as the final output.
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Equation Form	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 Method	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.
Threshold	Upper and lower limits of measurement results.

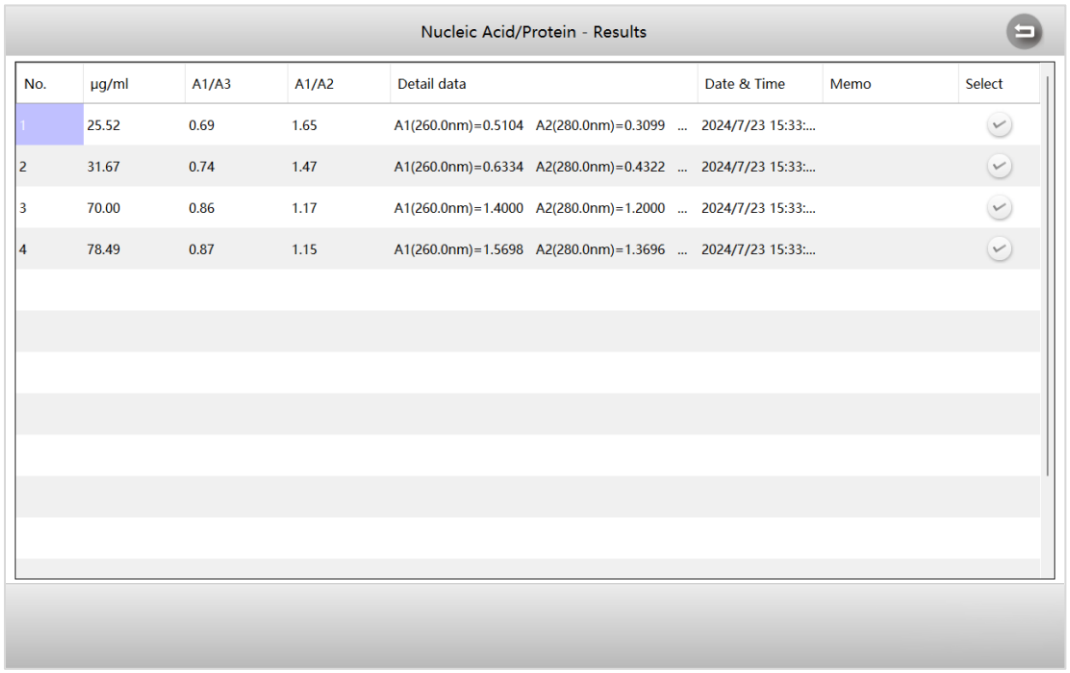
3 **Method** interface, load or new a method, click the button  to accept and return to measurement interface.

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

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

6 Repeat step 5 to measure more samples.

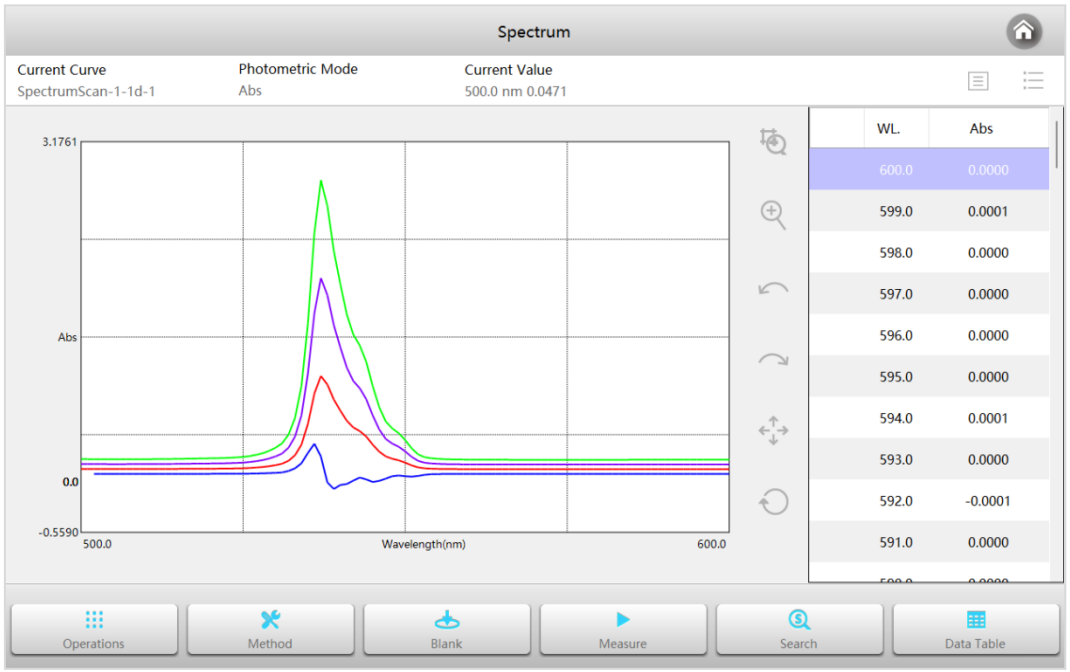
7 Click  to switch to list mode to browse the list of measurement results.



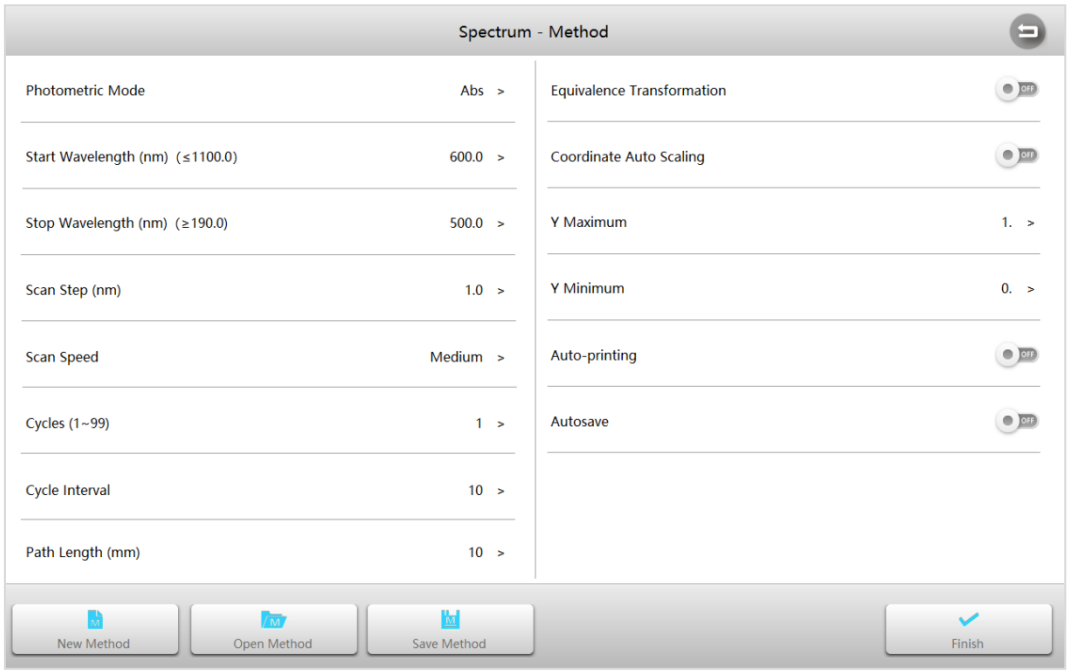
Spectrum

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

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



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



Photometric mode	2 photometric mode: Abs, %T.
Start wavelength	Scan start wavelength, range: 190~1100nm.
Stop wavelength	Scan stop wavelength, range: 190~1100nm.
Scan Step	7 wavelength interval selectable 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10.0nm.
Scan Speed	3 scan speed selectable: Quick, Medium, Slow.
Cycles	Scan times.
Cycle Interval	Interval between 2 scans.
Path Length	The width of the cuvette used for the measurement.
Equivalence Transformation	Activation automatically converts measurements from different path cuvettes to values in the 10mm light path length.
Coordinate Auto Scaling	Whether to automatically adjust the coordinates based on the data.
Y Maximum	The maximum value of the ordinate (valid only when the coordinates are fixed).
Y minimum	Minimum value of the ordinate (valid only when the coordinates are fixed).
Auto-printing	Automatically print curves and results after measurement is complete.
Autosave	Automatically save curves and results after measurement is complete.

2 Put the reference in the measurement channel, close the sample chamber cover, and click the button  to scan baseline.

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

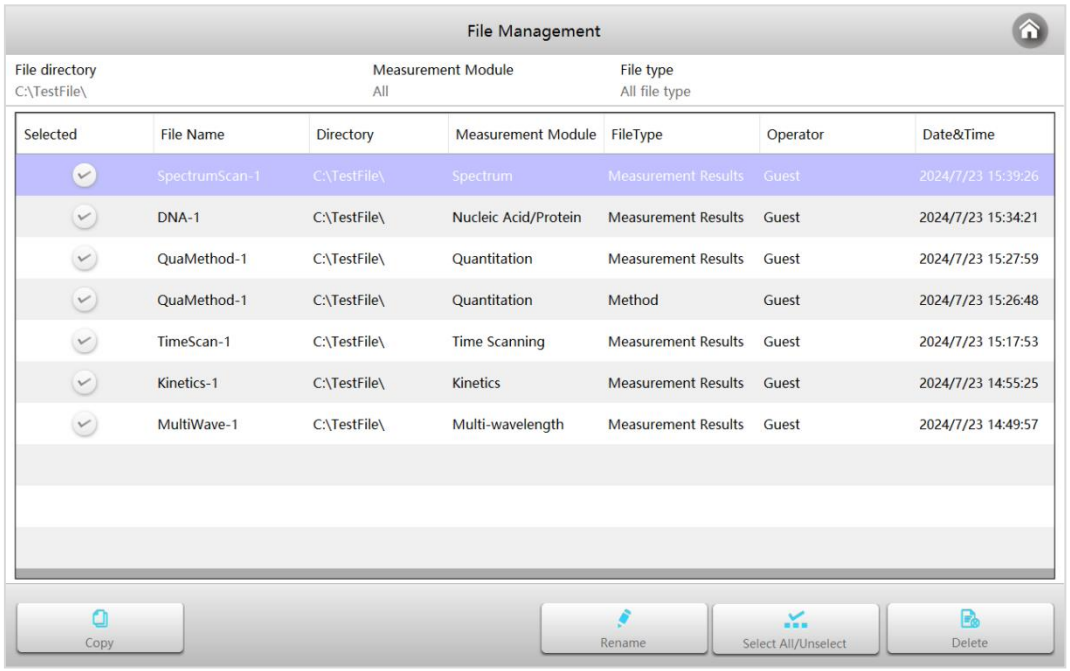
4 After the scan is complete, click the button  to zoom the graph as needed.

1. Click 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, click 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. Click **Measurement Mode** and **File 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 click the button  to delete it.

Copy files

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

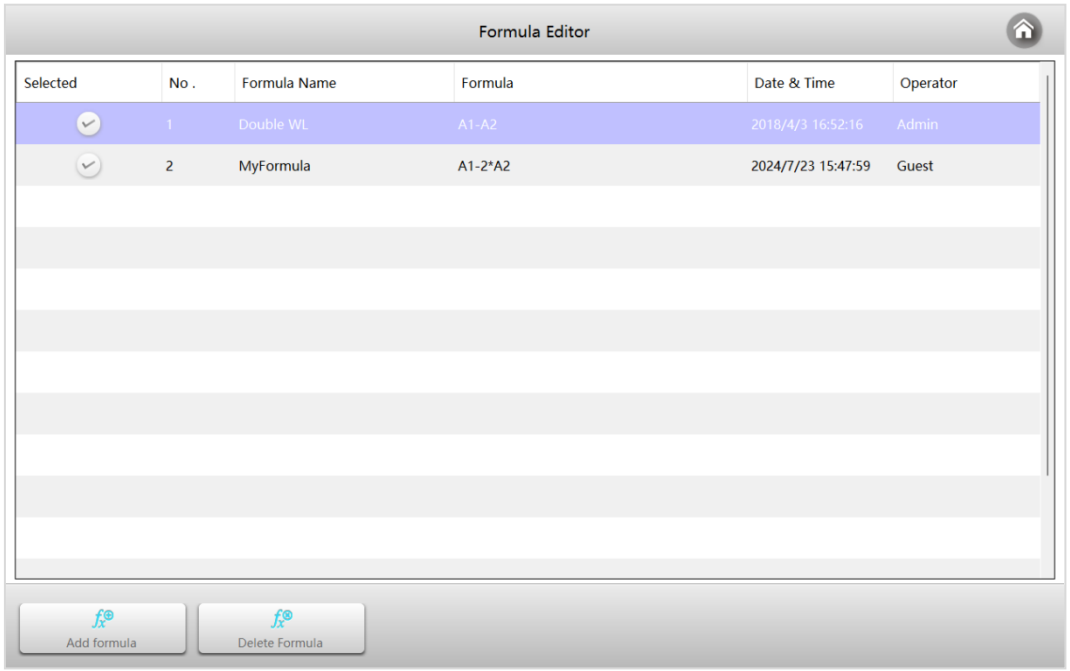
Rename file name

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

Formula editor

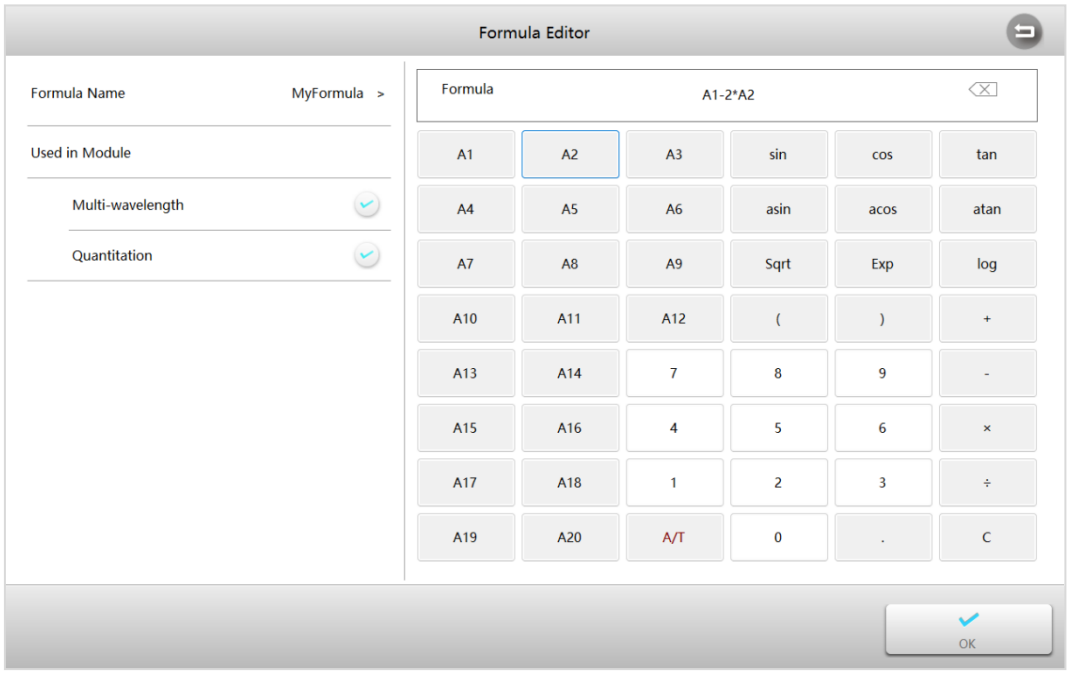
Formula Editor is used to write formulas for photometric calculations.

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



Add calculation formula

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



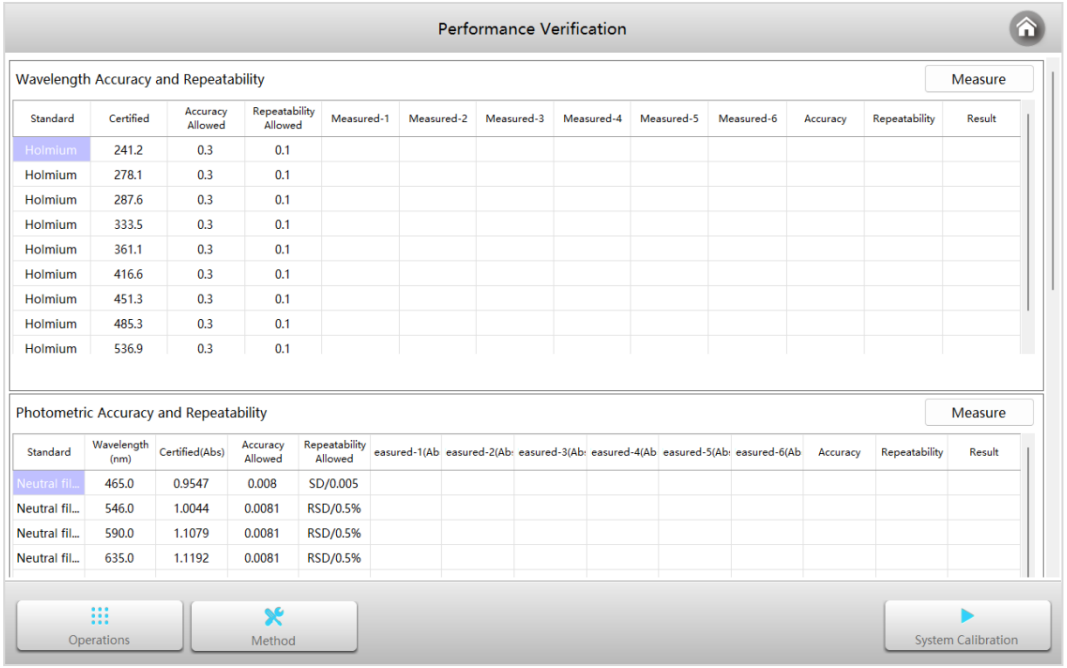
Delete calculation formula

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

Performance Verification

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

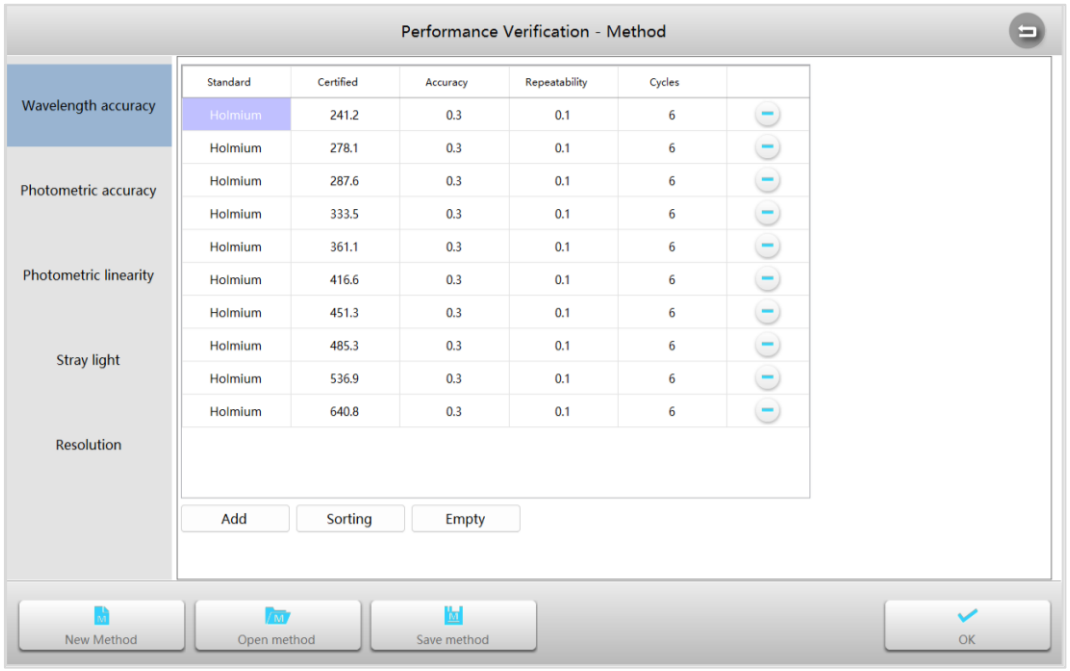
Main interface, click the icon  to start **Performance Verification**.



The performance validation module has two built-in validation templates to meet the United States Pharmacopoeia (USP) and European Pharmacopoeia (EP) for direct use by the user. Users can modify based on the templates or create new test methods, and save them for use during testing.

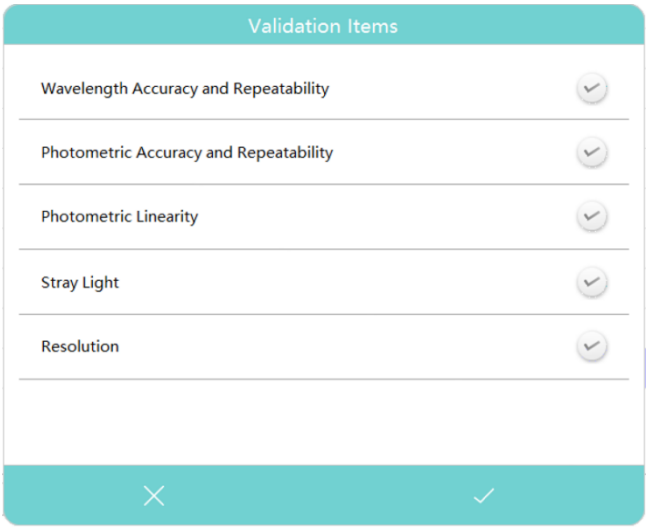
Establish user's performance validation methods

Performance Verification interface, click the button  to enter the **Method** interface.



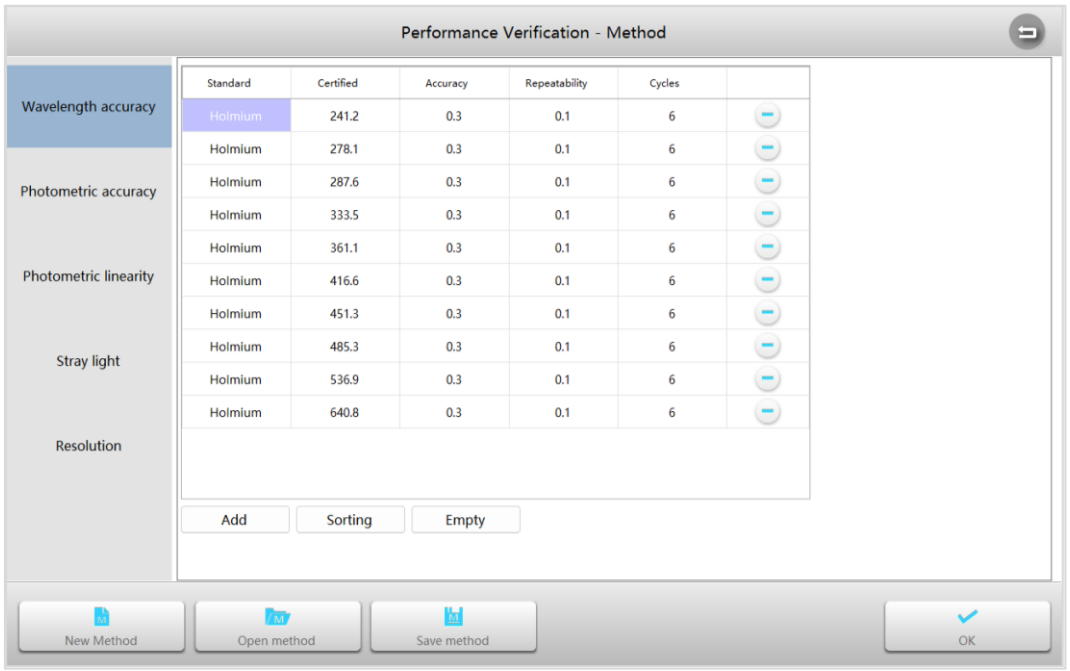
1 Select Validation Items

Click **New Method** to create an empty method template. In the **Validation Items** pop-up window, select the items that need to be validated and click .



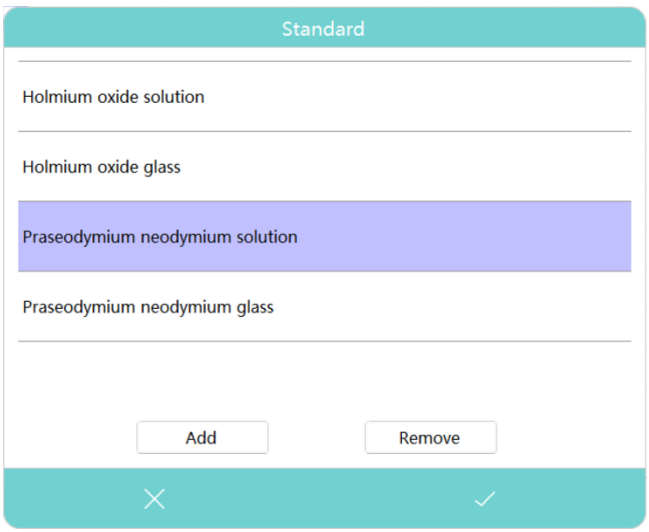
2 Edit wavelength accuracy verification

Click the **Wavelength accuracy** tab in the verification items column on the left. Enter the parameter editing interface for wavelength accuracy.



1) Click the button **Add** to add a test point.

2) Click the cell in the **Standard** column to select a standard.



Information *If you are using a Standard that is not in the list, you can click the Add button to add it to the list, or you can remove the selected Standard from the list.*

3) Click the cell in the **Certified** column to enter a certified wavelength test point.

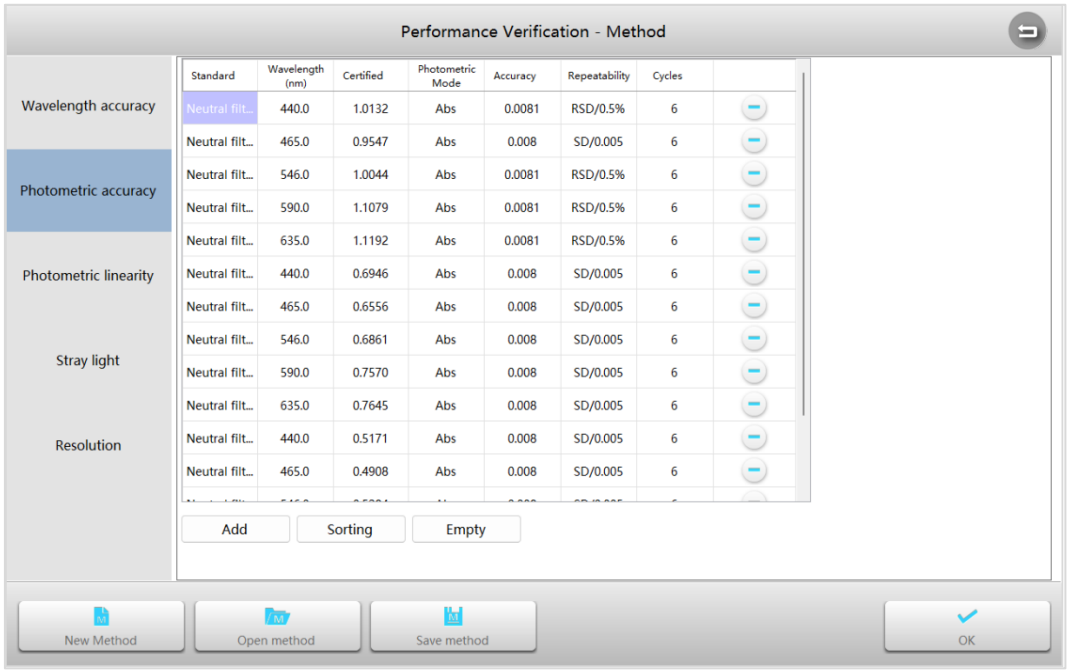
4) Click the cell in the **Accuracy** column to enter the allowable deviation for wavelength accuracy.

5) Click the cell in the **Repeatability** column to enter the allowable deviation for wavelength repeatability.

6) Click the cell in the **Cycles** column to enter the number of tests.

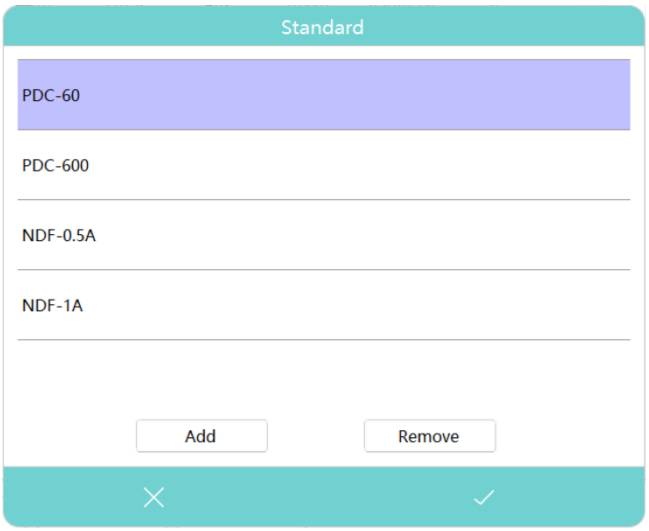
3 Edit photometric accuracy verification

Click the **Photometric accuracy** tab in the Verification Items column on the left. Enter the parameter editing interface for photometric accuracy.



1) Click the button **Add** to add a test point.

2) Click the cell in the **Standard** column to select a standard.

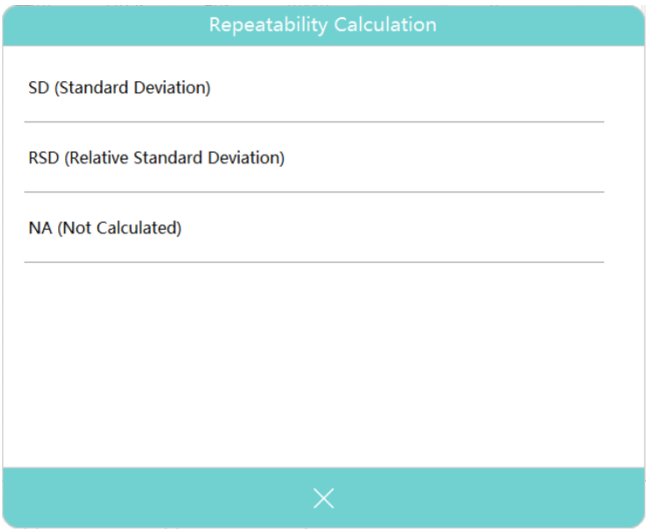


3) Click the cell in the **Wavelength** column to enter a wavelength test point.

4) Click the cell in the **Certified** column to enter a certified photometric test point.

5) Click the cell in the **Accuracy** column to enter the allowable deviation for photometric accuracy.

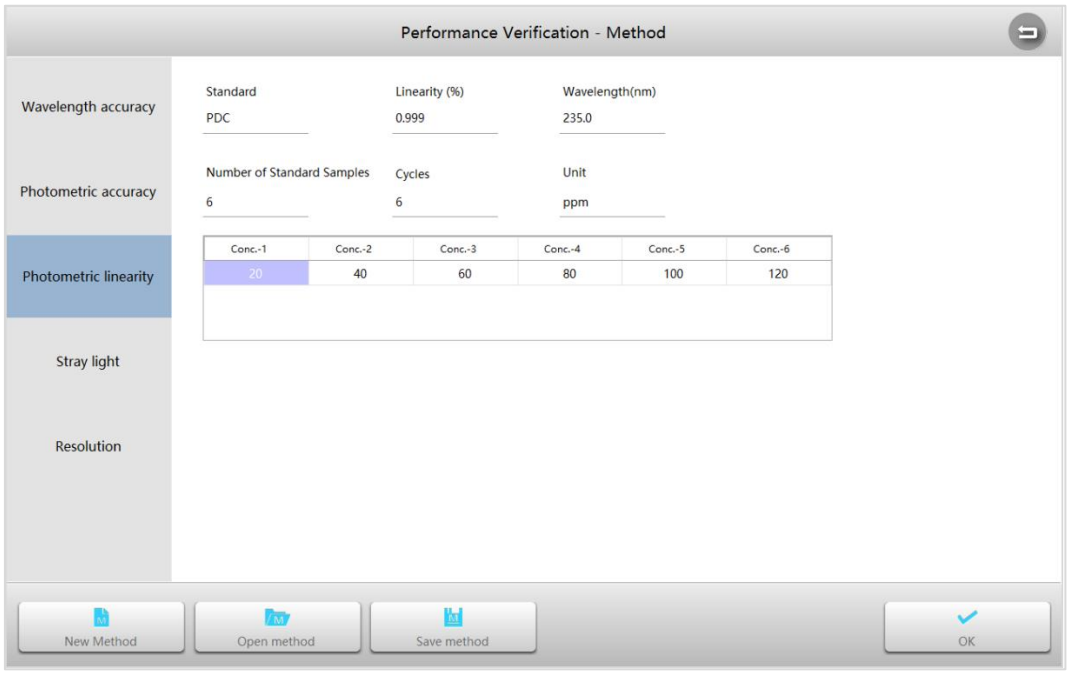
6) Click the cell in the **Repeatability** column to select the repeatability calculation method and enter the allowable deviation for photometric repeatability.



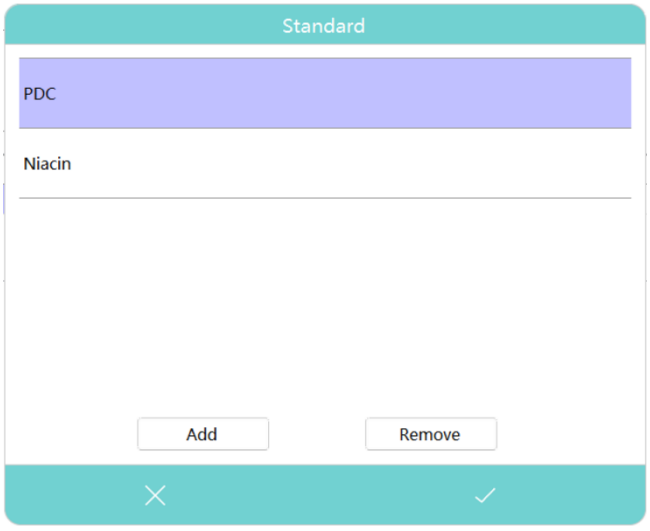
7) Click the cell in the **Cycles** column to enter the number of tests.

4 Edit photometric linearity verification

Click the **Photometric linearity** tab in the Verification Items column on the left. Enter the parameter editing interface for photometric linearity.



1) Click the cell in the **Standard** to select a standard.

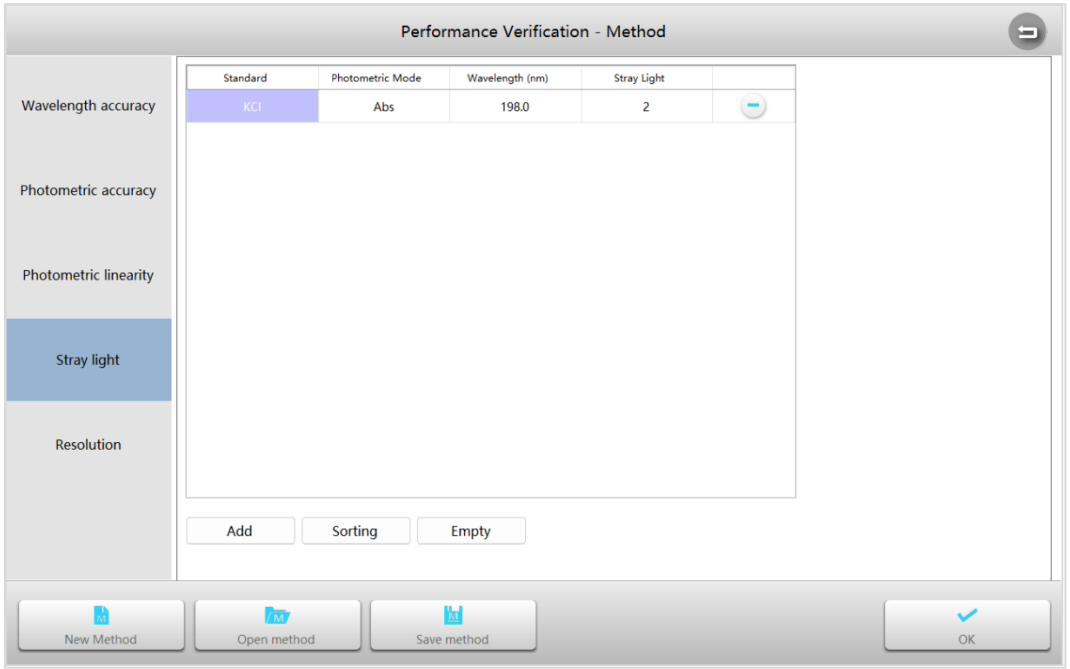


2) Click the parameter item to set the parameter.

3) Enter the concentration of the standard sample in the table.

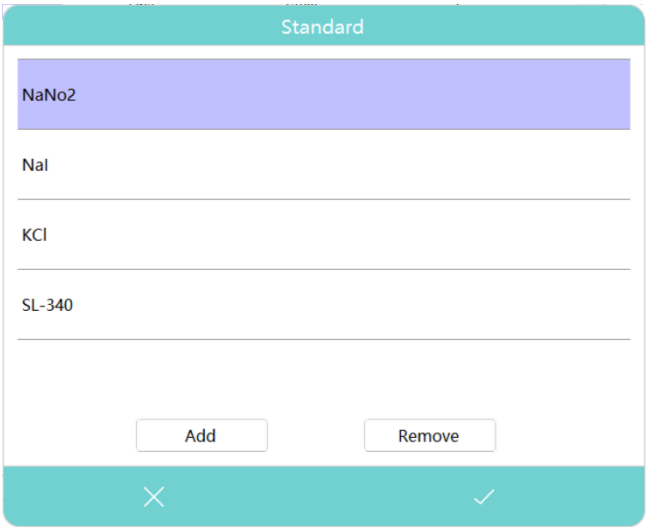
5 Edit stray light verification

Click the **Stray light** tab in the Verification Items column on the left. Enter the parameter editing interface for stray light.



1) Click the button **Add** to add a test point.

2) Click the cell in the **Standard** column to select a standard.



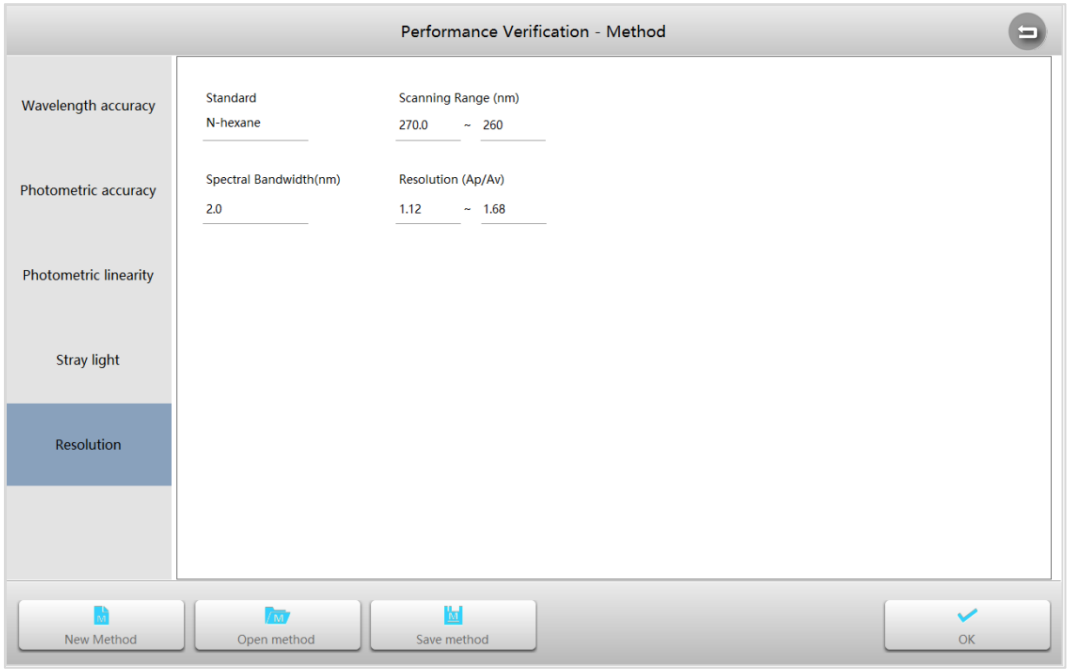
3) Click the cell in the **Photometric Mode** column to select Abs or %T.

4) Click the cell in the **Wavelength** column to enter the test wavelength.

5) Click the cell in the **Stray Light** column to enter the allowable deviation for stray light.

6 Edit resolution verification

Click the **Resolution** tab in the Verification Items column on the left. Enter the parameter editing interface for resolution.



1) Click the cell in the **Standard** to enter standard name.

2) Click **Scanning Range** to set the scanning wavelength range.

3) Click **Resolution** to enter the allowable deviation for resolution.

7 Finished

Click the button **Save method** to save the verification method. Establishment of the validation method is complete.

Verify performance

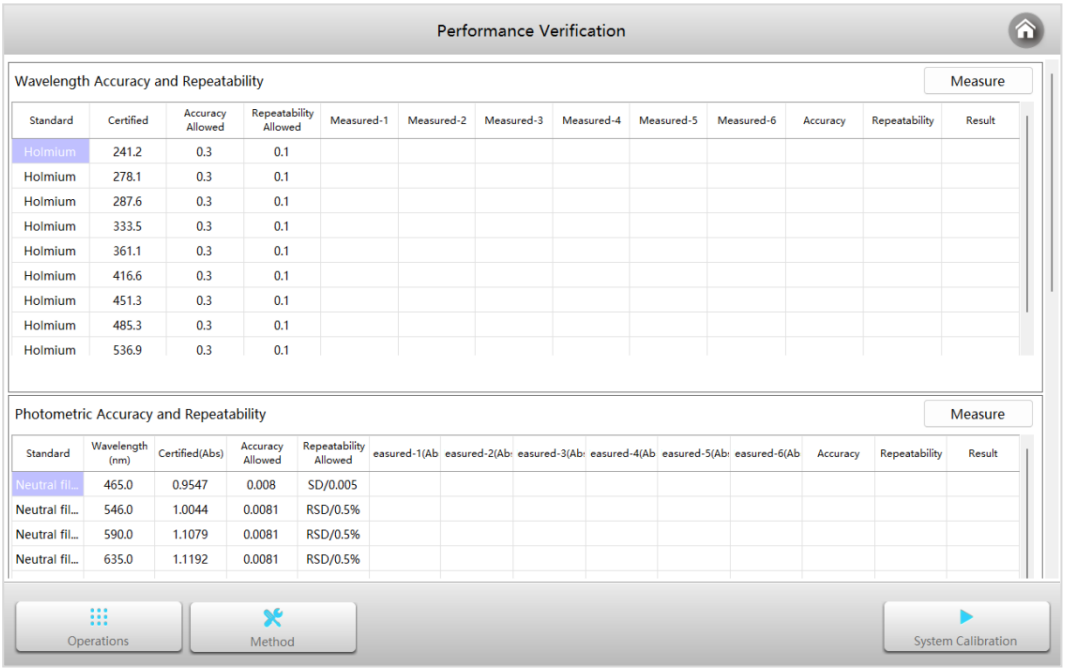
1 Preparing

- 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 standard 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.*

2 Open the performance verification method

Performance Verification interface, Click the button **Method**, **Open method** to open a performance verification method, click the button ✔.



3 **System calibration**

Remove anything from the measurement and reference channels and close the sample chamber lid. **Performance Verification** interface, Click the button  to do system calibration.

4 **Verify**

Click the button **Measure** and follow the prompts of the software to put in the **reference** or **standard** to complete the test.

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.

Check Lamp

The light sources used in this instrument are consumables. It is recommended that you obtain a sufficient number of these parts, taking into account the frequency of use of the instrument.

Assuming that the instrument runs for 8 hours per day, the light source will be used for approximately 160 hours/month (20 working days) and approximately 1920 hours/year (240 working days). You need to replace the light source every 10 to 12 months.

Spare Parts Replacement

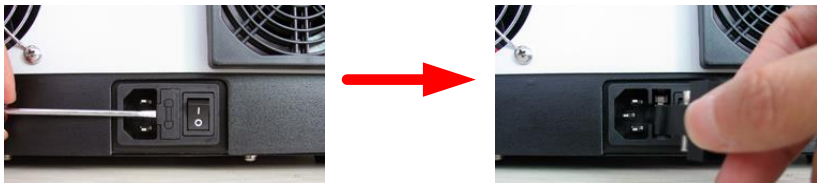
Replace the fuse



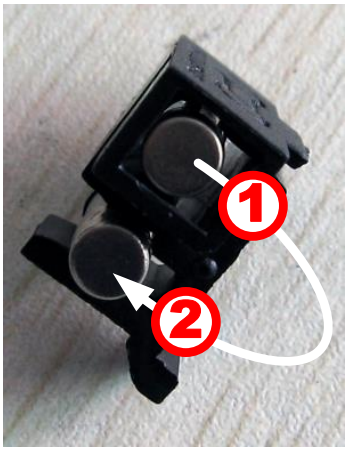
Danger! ***Be sure to switch off the power and unplug the socket before replacement!***

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**

Use a screwdriver to pry open the fuse holder.



4. **Replace a new fuse**
   Pick out the spare fuse (position 1) and replace with position 2. Install the fuse holder back to the instrument power outlet.



5. **Power on**
   Plug the socket and switch on the power.

Replace lamps

Please contact your local VWR representative.

User replaceable accessories and spare parts

Description	Quantity	Cat. No.
CELL HOLDER, 4-CELL,10 TO 50MM	1PC	634-6045
CELL HOLDER, 4-CELL, 10 TO 100MM	1PC	634-6046
CELL HOLDER, SINGLE CELL	1PC	634-6047
CELL HOLDER, FOR CYLINDRICAL CELL	1PC	634-6048
CELL HOLDER, WATER-JACKETED, 1 CELL, 10MM	1PC	634-6049

CELL HOLDER, WATER-JACKED, 4 CELL, 10MM	1PC	634-6050
CELL HOLDER FOR TEST TUBES	1PC	634-6051
CELL HOLDER, SOLID SAMPLE	1PC	634-6052
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 100MM	1PC	634-1234
CELL HOLDER,8-POSITION AUTO CELL CHANGER, 10MM	1PC	634-1232
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
SIPPER UNIT WITHOUT PELTIER TEMP. CONTROL, A-1100	1PC	634-1152
SIPPER UNIT WITH TEMP. CONTROL, A-1000	1PC	634-1153
PELTIER UNIT, A-1200	1PC	634-1154
FUSE, 3.15A/250V	1PC	634-0651
SOFTWARE UVSTUDIO STANDARD	1PC	634-1182
SOFTWARE UVSTUDIO 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. Lamps have a warranty of 1000 h lamp usage time or 6 months max. 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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