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UV-Vis Spectrophotometer

# OPTIZEN POP

User Guide

Basic Operation Guide





# OPTIZEN POP

## User Guide

Spectrophotometer from K LAB CO.,LTD.

OPTIZEN POP

User Guide

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## Introduction

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Thank you for purchasing OPTIZEN POP, the UV-Vis spectrophotometer from K LAB.

This User Guide describes the details of installation, operation, cautions for users, accessories, and options of OPTIZEN POP. Please read the User Guide before using the product and follow the instructions when using the product. Moreover, keep the User Guide properly for your reference.

## Important

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Keep this User Guide with the product.

Familiarize with safety guidance before using the product to ensure that you operate the product safely and properly. Contact K LAB Customer Center if you need to recalibrate or reinstall the product. Contact K LAB Customer Center if the User Guide is lost or damaged.

### Copyright

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## Safety

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- Thoroughly familiarize with safety guidance before using the product to ensure that you operate the product safely. Follow all warnings and cautions in the User Guide.
- Damage to the product or injury to the user may occur when using the product outside its intended use.
- Unauthorized repairs or structural changes may cause performance and quality problems.
- K LAB shall not be liable for any damages arising from improper use or any violation of laws, rules, regulations related to safety.
- The warning and cautions are presented using the following rules in this manual:

 **Warning**

This mark indicates a potentially risky situation, and failure to follow the instruction may lead to serious injury or even death.

 **Caution**

This mark indicates a potentially risky situation, and failure to follow the instruction may lead to a light injury or product damage.

 **Note**

This mark indicates additional information provided to ensure proper use of this product.

- To prevent damage to the product, and injury or death to the user, please read the information with the above symbols.

## Caution

### Caution for Installed Area

#### Warning

Install a ventilation system in the installed area if you use a flammable or toxic sample.

#### Caution

· The size and weight of this product are as follows.

Overall Size (W x D x H)	420 mm x 370 mm x 180 mm
Weight	9.5 kg

- Consider the total weight during the product installation. The table on which the product is installed must be able to withstand the total weight of the product.
- Use a stable table with the depth of at least 400 mm. Otherwise, the product may tilt or fall.
- Avoid areas that are exposed to corrosive vapor or excessive dust. Such adverse conditions can be detrimental to the performance of the product and can shorten its life.
- The range of environmental conditions when installing the product is as follows:

Temperature Range	5~40 °C
Moisture Range	30~80%
Altitude	Up to 3,100 m
Pollution Degree	2
Used Place	Indoor use only

- Please check the environment of the installation site to meet the following requirements.
- Where there is no dust, corrosive gas or vibration
- Where RSRP(Reference Signal Received Power) does not exceed -70dBm
- Where it is not exposed to direct sunlight or an environment of high temperature and humidity

## Caution

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### Caution for Installed Area

#### **Warning**

- Please confirm the input rating information of the equipment (power supply voltage, power consumption and frequency) and apply power to the equipment.

Voltage	95~240 VAC
Frequency	50/60 Hz
Power Consumption	80 W

- Grounding is crucial to prevent electric shock and ensure reliable operation due to sudden accidents or power interruption. Connecting to a power source without protective earth connection may cause electric shock or damage to the product.
- Do not place a heavy object on the power cord. Keep hot objects away from the product.
- Do not modify the power cord by any means.
- In case of an earthquake or disaster, take precautions to prevent the equipment from falling.

#### **Caution**

- The fan is built into the back of the product. Please keep a certain distance when installing on the wall.

## Caution

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### Operating Precautions

#### **Warning**

- Using the product in a manner not specified in this manual may damage the product.
- If an emergency occurs, remove the power plug.
- Always turn off the lamp before opening the lamp cover, as this may damage the eyesight of the user due to the light of the lamp used in the product.
- Visually observing ultraviolet light without any protective equipment can cause visual impairment and permanent blindness.
- There is a risk of burns when you touch the lamp or its surroundings for about 10 minutes after the lamp is turned off.
- If you use the product at a temperature of 50 °C or more, the back of the product may get hot. Please be careful.
- Always wear safety gloves when you are using a specimen that is hazardous or causes biologic infection.

#### **Caution**

- Avoid the use of alkaline solution over pH 9.5 as it may damage optical parts.
- Avoid the use of metal corrosive solutions.
- Do not use plastic cells that may be damaged by alcohol or general organic solvents.
- Do not place heavy objects on the product.
- Do not subject the product to external shock or impact.
- When storing the equipment in a place below the reference temperature condition, please use it after storing at room temperature for a certain time because it may cause condensation inside the product.
- Always disconnect the power cable after using the product.
- About 1 hour of preheating is required for commissioning test or measurement. Insufficient warm-up time can cause inaccurate measurements or measurement errors.

## Support

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### Precautions for inspection and maintenance

#### Warning

- Unplug the power plug during inspection, repair, or maintenance.
- Do not remove the main cover of the product. Doing so may cause injury or product malfunction. This equipment is designed to eliminate the need to remove the main cover during maintenance.
- If the power plug is covered with dust, disconnect the plug from the outlet and remove the dust with a dry cloth.
- If water enters the equipment, wipe it immediately to avoid rust. Do not use alcohol or thinners to clean the equipment.
- You are responsible for handling the sample wastes generated during the analysis. Please dispose of your completed samples in accordance with national laws and regulations for waste disposal.
- The rating and characteristics of the fuse are as follows.

Dimension	20 mm
Voltage Rating	250 V
Current Rating	2 A

### Technical support

#### Warning

- If you have any problems with our product, please contact us or our authorized agent to get service. Please refer to the contact information listed in the back of this guide.
- If a non-certified part is applied to this equipment, the equipment may be damaged.

## Product Warranty

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K LAB provides the warranty for the product as specified below.

### **1. Product Warranty Period**

Please contact K LAB's Customer Center for the detailed information on the warranty period and scope.

### **2. Description Product Warranty**

K LAB will replace or repair the part at free of charge if the part fails due to an internal defect in the machine (software or hardware) during the warranty period. The consumables or accessories with remaining life may not be subject to free repair or replacement.

### **3. Exclusion from Product Warranty**

The failure caused by any of the following will not be subject to product warranty even during the warranty period.

- 1) Alteration or improper use of the product.
- 2) Product repair or modification of the product by a person or company that is not K LAB or company designated by K LAB.
- 3) Damage to the data including the basic software or product due a virus occurring inside the computer.
- 4) Internal damage of the product caused by electric short or sudden voltage drop.
- 5) Error caused by reasons other than the equipment itself.
- 6) Failure caused by use in a poor environment exposed to strong vibrations or vapor that causes high temperature, humidity, or corrosion.
- 7) Failure caused by external shock including fire, earthquake, or pollution by hazardous material.

\* You must comply with the rules specified in the document if the product has documentation such as a warranty or if there is a separate agreement that contains warranty terms. The specific warranty period is provided separately for products that are manufactured differently from the standard specifications for special applications.

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# Ch. 1

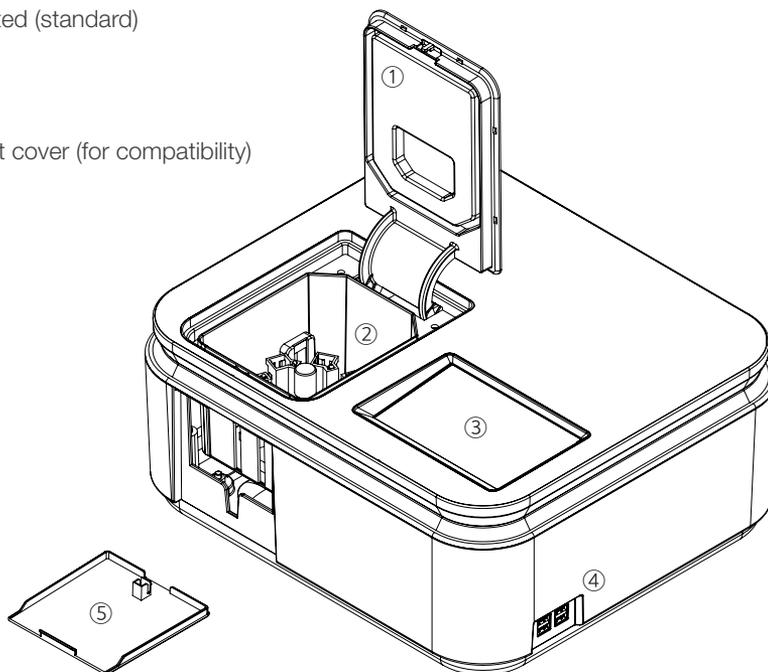
## Introduction

- 1-1 Structure
  - 1-1-1 PC Connection
- 1-2 Self-Diagnosis Function
- 1-3 Main Page Mode
- 1-4 Quick Menu and Function
  - 1-4-1 Measured Value Monitoring
  - 1-4-2 Volume Adjustment
  - 1-4-3 Quick Cell Type Selection
  - 1-4-4 Lamp Preheating Condition Checking

## 1-1 Structure

Ch.1

- ① One-touch type cell holder cover
- ② Multi Cell mounted (standard)
- ③ 7" color screen
- ④ 4 USB ports
- ⑤ Detachable front cover (for compatibility)

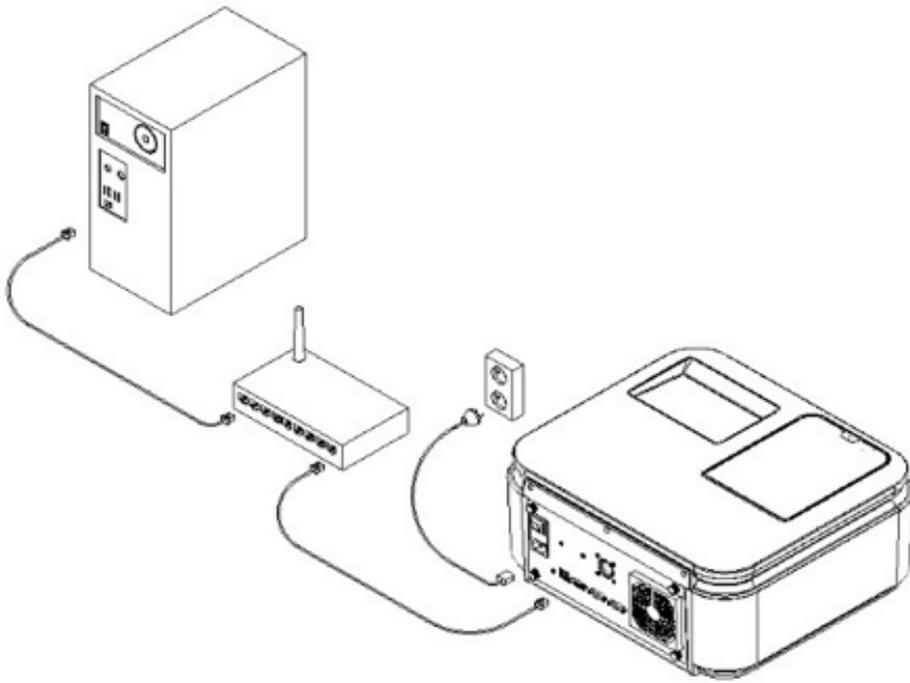


### **i** Note

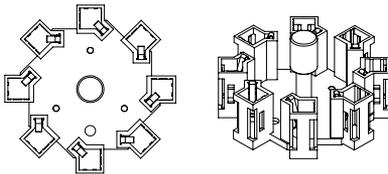
- AC Power Connector: AC power socket for AC power cable connection
- Ethernet Port: Port used to control equipment using PC program
- Serial Port: RS232 communication port required to attach additional accessories to the equipment

## 1-1-1 PC Connection

- ① Connect the AC power connector to the power outlet using the AC power cable for power supply.
- ② To communicate with PC, connect PC and router, device and router using LAN cable, respectively.  
However, when connecting to router, WAN port is not used.



### **i** Note



### **The Multi Cell is adopted as a standard**

You can measure more specimens automatically using the Multi Cell holder mounted as a standard.

## 1-2 Self-Diagnosis Function (Built-In-Test, BIT)

Ch.1

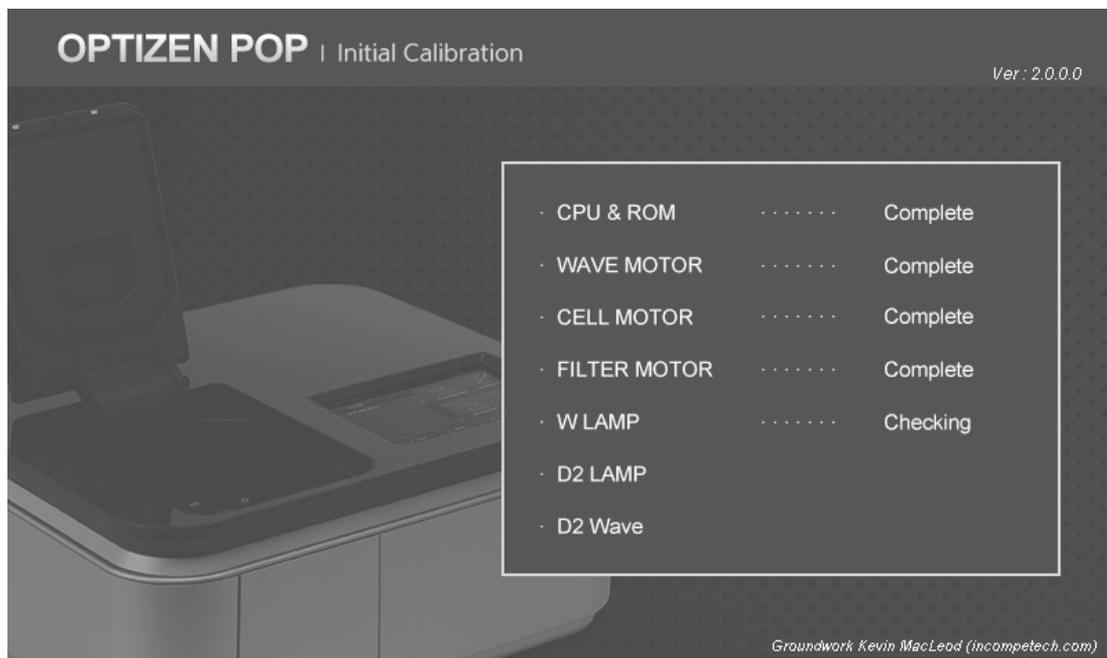


Fig. 1.1

The product begins BIT to check the status of the device when you turn it on. BIT includes the testing of CPU & ROM, wavelength conversion, cell holder operation, filter operation, deuterium (D2) lamp, and tungsten halogen (W) lamp. It checks each item and displays the result. It indicates Warning if there is a problem with the device and waits for user confirmation. You can touch [OK] to continue to the next step. The display moves to the main page if all conditions are normal. Please contact Technical Support or After-Sales if a warning is displayed.

### **i** Note

You must preheat the lamp for about 30 minutes after turning on the equipment to obtain a stable measured value.

\* *The product can begin measurement and operation immediately without preheating.*

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## 1-3 Main Page Mode

Ch.1

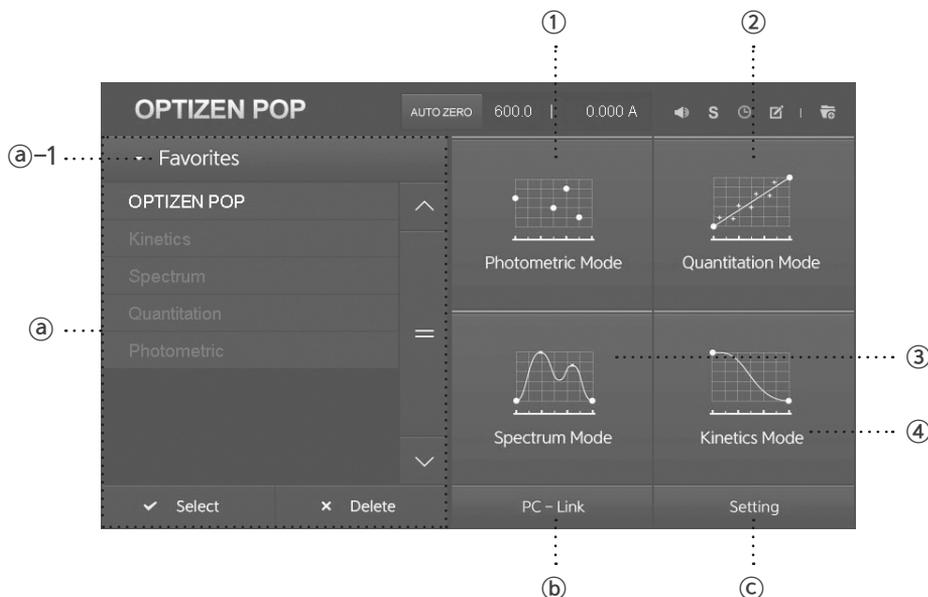


Fig. 1.2

### ① Photometric Mode (Absorbance Measurement Mode)

- This mode enables easy measurement of absorbance (Abs) (or transmittance (%T)) in a specific wavelength.
- You can set the Factor (K) value to examine specimens quantitatively with only Abs measurement.
- You can set up to 8 wavelengths, and the absorbance for each wavelength is automatically measured.
- You can use the MultiCell holder to analyze up to 7 specimens automatically.

### ② Quantitation Mode (Fixed Amount Analysis Mode)

- The mode uses the MultiCell holder to measure and manage the calibration curve.
- You can analyze a sample quantitatively using the calibration curve generated with up to 7 specimens of various concentrations.
- The product provides four calibration curve types: Linear (Zero-crossing), Linear, Quadratic, and Cubic.
- You can generate an accurate calibration curve with up to five repeated measurements.

### ③ Spectrum Mode (Absorbance Spectrum Acquisition Mode)

- The mode can check the spectrum of the user-specified wavelength band.
- A shortcut key allows the data switch between Abs and %T.
- You can analyze the spectrum of up to 7 specimens (excluding the reference specimen) automatically.
- The mode includes the functions to magnify the viewing zone and to find the peak and valley positions.

#### ④ Kinetics Mode (Temporal absorption information change confirmation mode)

- This mode enables checking of the absorbance (Abs) (or transmittance (%T)) change with time in a specific wavelength.
  - The measurement is made in the specified interval, and the minimum specified interval is 1 second.
  - The progress rate is displayed during a measurement of up to 24 hours.
  - The mode automatically provides the absorbance change of up to 7 specimens.
- \* You can adjust the minimum measurement interval according to the measurement range and condition.

#### ③ Favorites

You can register the data during or after the measurement or analysis and retrieve them quickly for further analysis.

##### **i Note**

③-1 You can sort the data saved by touching (or clicking) the [Favorites] button in a descending or ascending order of modification period or save time.

#### ② PC-Link

Change the model of OPTIZEN POP to Remote mode to interface the product to a PC through OPTIZEN View (PC software). (Please contact K LAB for the PC software.)

#### ① Settings

You can change the default equipment data, network, event, and system setting or calibrate the equipment.

## 1-4 Quick Menu and Function

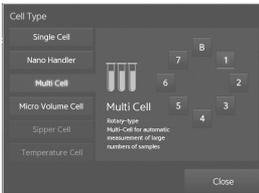


Fig. 1.3

### 1-4-1, ① Measured Value Monitoring

You can check the real-time measured value at any time. \* The [AUTO ZERO] quick button is provided.

#### **i** Note



The operation moves to the selected cell and begins a real-time measurement if you select a cell number in the MultiCell tab of ③ **Quick Cell Type Selection** page.

\* You can select only one cell, and the position or condition of the selected cell is displayed in an icon.  
Cell position: Mb, M1, M2, M3, M4, M5, M6, or M7 / Cell condition: s, n, or  $\mu$

### 1-4-2, ② Volume Adjustment

You can adjust the equipment volume in 16 levels according to the lab environment.

### 1-4-3, ③ Quick Cell Type Selection

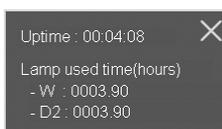
You can monitor measurement by selecting a cell type without entering a mode and easily check the cell condition since the Quick Menu Cell Type icon is changed according to the cell type condition or position.

\* Please refer to **Section 8-1 Cell Type Setting in Ch. 8** for more detailed information.

### 1-4-4, ④ Lamp Preheating Condition Checking

You can check the operating time, lamp preheating condition, and accumulated usage time of lamp to make measurements in optimal condition. \* *The equipment can begin measurement immediately without preheating.*

#### **i** Note



Operating time: Equipment usage time / Lamp usage time: Total accumulated usage time of lamp.

\* The icon of the quick menu is displayed in yellow before the lamp preheating.  
The icon of the quick menu is displayed in green one hour after the lamp preheating.

---

**⑤ Help**

You can check the description or precautions of program functions or features.

**⑥ Explorer**

The files in the equipment storage space and external storage space can be copied or deleted.

\* Please refer to **Section 8-2 Explorer in Ch. 8** for more detailed information.

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# **Ch. 2**

## **Photometric Mode (Single Wavelength Mode)**

- 2-1 Description of Photometric Mode
- 2-2 Measurement
  - 2-2-1 File Retrieve/Save
- 2-3 Setting
  - 2-3-1 Unit Setting
- 2-4 Report
  - 2-5 Using Mode (Simple Optical Density Measurement Mode)

## 2-1 Description of Photometric Mode

Photometric Mode (Single Wavelength Mode)

Ch.2

The mode measures the sample specimen in the user-specified wavelength and calculates the absorbance, transmittance, and concentration.

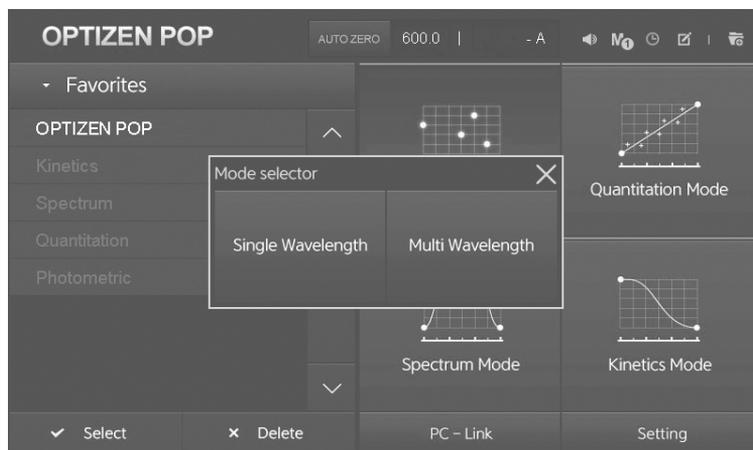


Fig. 2.1

When you select Photometric Mode, the mode selection window to select the single wavelength mode or multi-wavelength mode is created.

\* Please refer to **Section 2-2 Measurement in Ch. 2** for more detailed information on single wavelength mode.

\* Please refer to **Section 3-1 Measurement in Ch. 3** for more detailed information on multi-wavelength mode.

## 2-2 Measurement

Photometric Mode (Single Wavelength Mode)

ABS, %T, and Conc. can be measured.



Ch.2

Fig. 2.2

### Data (Table) Description

Name	Description
Date	Measured date.
Time	Measured time.
#	Measured cell no. or measured cell type.
Sample Name	Sample name.
Wavelength	Measured wavelength.
Temperature	Temperature of cell box during measurement.

### Description of Main Buttons

Name	Description
File	The stored file is retrieved, or the measured data are saved.
Auto Zero	The blank is measured as the zero point.
Measurement	The measurement sample is inserted and measured.

### To Retrieve File

Ch.2

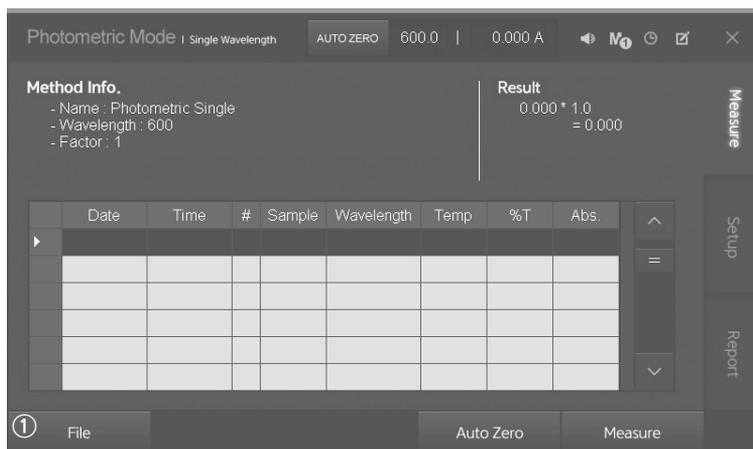
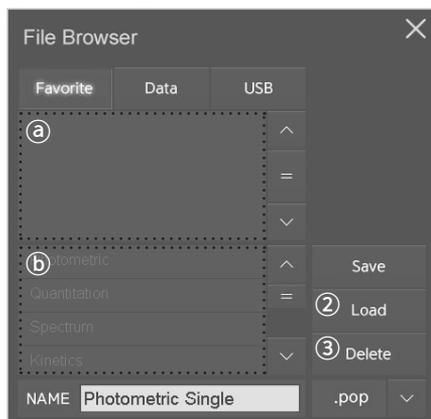


Fig. 2.3



**Note**

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space

**[USB]** : Default USB drive

Fig. 2.4 (a) Displays the folder list / (b) Displays the file list of the folder.

1. Press (1) **File**
2. Select the drive from [Favorites], [Data], or [USB] to retrieve the file.
3. Select the (a) folder to read from the folder list.
4. Click the (b) file to select it to read from the file list.  
Confirm the retrieved file from File Name
5. Retrieve the file by clicking (2) **Load**
6. Delete the selected file by clicking (3) **Delete**

## To Save File

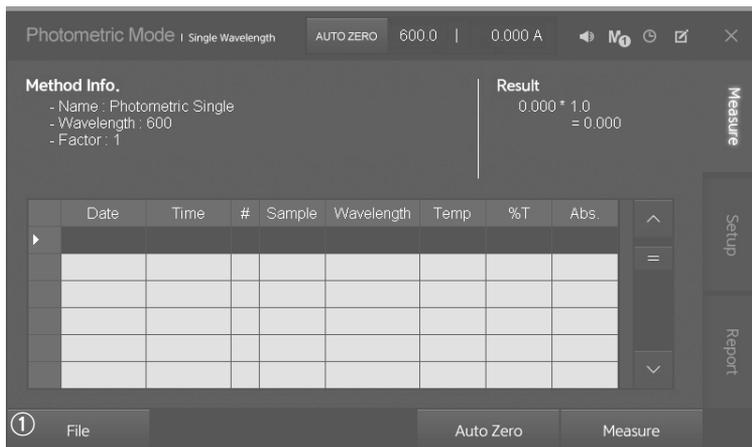


Fig. 2.5

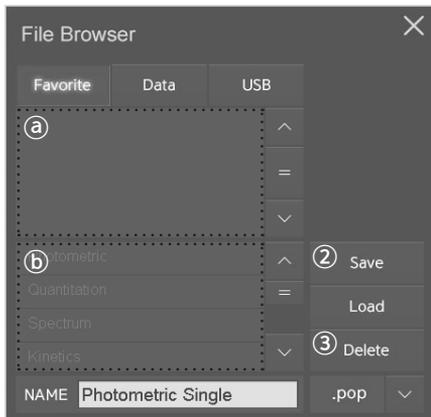


Fig. 2.6 (a) Displays the folder list / (b) Displays the file list of the folder.

### Note

#### Data Format

**.pop** : Data format exclusive to the Pop system

**.txt** : Text format

**.csv** : A type compatible with spreadsheet or database

\* .csv file is compatible with MS Office Excel

1. Press (1) **File**
2. Select the drive from [Favorites], [Data], or [USB] to save the file.
3. Select the (a) folder to save from the folder list.
4. Enter the file to save in File Name
- \* To overwrite an existing file, click it and confirm the file name.
5. Specify the file format (supported extensions: pop, csv, and txt).
6. Save the file by clicking (2) **Save**
7. Click (3) **Delete** to delete the selected file.

## 2-3 Setting

Photometric Mode (Single Wavelength Mode)

This section describes the window for measurement settings.

You can specify the name, cell type, wavelength, dilution multiplication, unit, and memo.

Ch.2

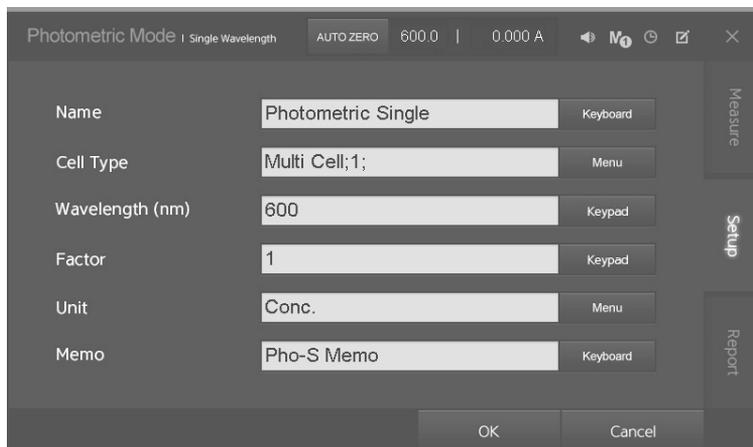


Fig. 2.7

### List of Settings

Name	Description	Detailed Description
Name	Specifies the name of the measured data.	
Cell Type	Selects the cell type to be used.	* Refer to <b>8-1 Cell Type Settings in Ch. 8</b>
Wavelength	Specifies the wavelength to be used.	Default value: 600 nm, Operating range: 190 - 1100 nm
Factor	Enters the dilution multiplication or other factors to obtain the concentration value reflecting the factor.	
Unit	Selects the unit to be used.	* Refer to <b>2-3-1 Unit Setting in Ch. 2</b>
Memo	Enters the memo if needed.	

## 2-3-1 Unit setting

Photometric Mode (Single Wavelength Mode)

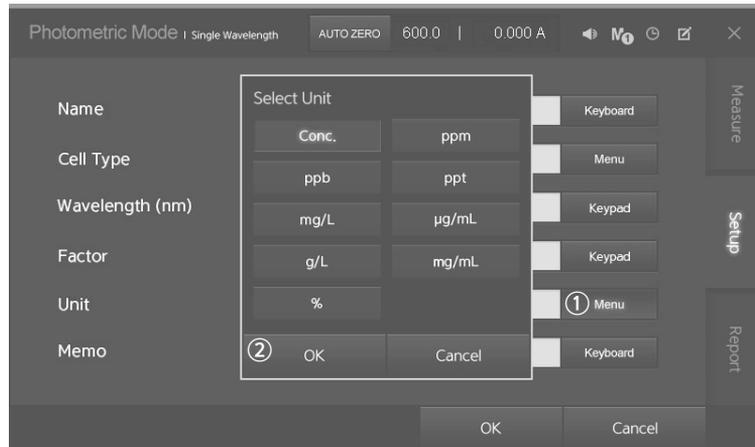


Fig. 2.8

1. Click ① **Menu** in the list of the Settings page.
2. Select the unit to be used.
3. Click ② **OK** to apply the selection.

Ch.2

## 2.4 Report

Photometric Mode (Single Wavelength Mode)

You can preview the selected data, select a section, and print it.

Ch.2

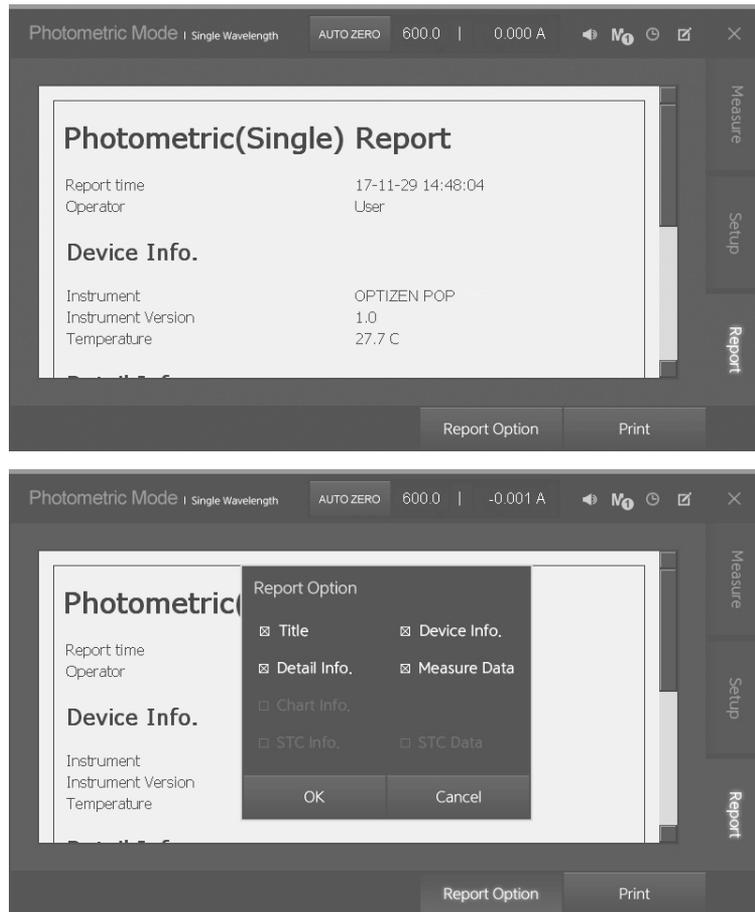


Fig. 2.9

### Detailed Description

Name	Description
Report Setting	Selects the content to print and prints it.
Print	Print

Name	Description
Device Info.	Shows the equipment information and the usage time of D2 and W Lamp.
Detail Info.	Shows the settings of Photometric Mode.
Measure Data	Shows the measured data of Photometric Mode.

## 2-5 Using Mode (Simple Optical Density Measurement Mode)

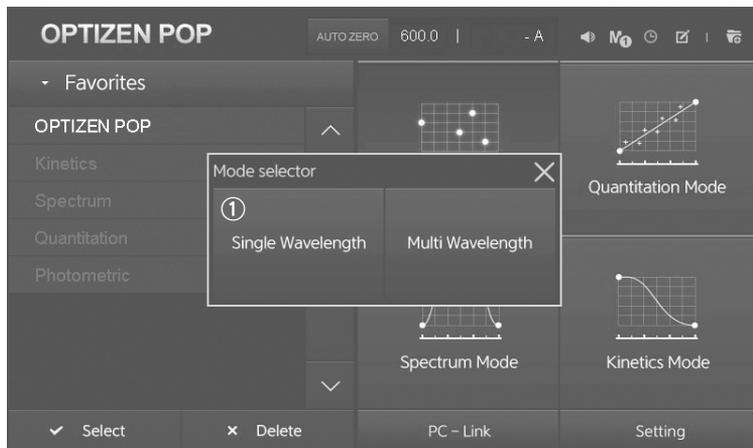


Fig. 2.10



Fig. 2.11

1. [Figure 1] Select ① **Single Wavelength** Mode on the main page.
2. [Figure 2] Move to the ② <Setup> tab and specify the measurement settings.

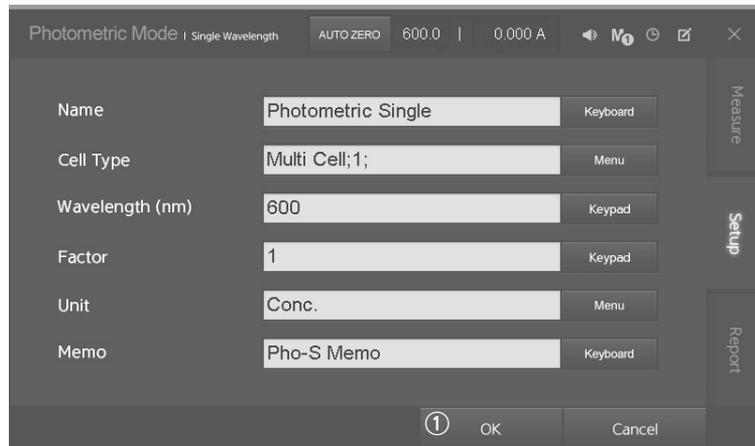


Fig. 2.12



Fig. 2.13

- [Figure 3] Click ① **OK** after selecting and entering the name, cell type, wavelength, dilution multiplication, unit, and memo.
- The display moves to <Measure> tab [Figure 4] automatically.
- [Figure 4] Run ② **Auto Zero** after inserting a blank in the selected cell holder.
- [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder after Auto Zero is run.
- [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder if there is an additional sample.
- You can check the measured data in a table form.

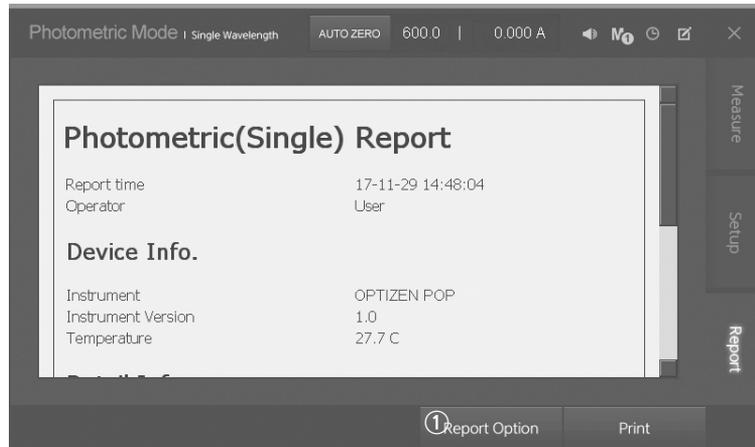


Fig. 2.14

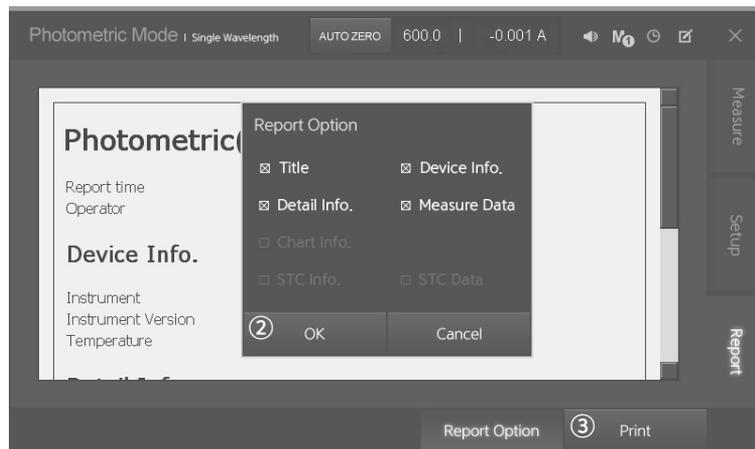


Fig. 2.15

9. Move to the <Report> tab to check or print the measured data in a report format.

10. [Figure 6] Click **1** **Report Option**, select the items to be included in the report, and click **2** **OK**

11. The STC (Standard Curve Info.) information is not applicable and thus is not displayed.

12. Check the contents to be printed and click **3** **Print** to print them.

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# **Ch. 3**

## **Photometric Mode (Multi Wavelength Mode)**

- 3-1 Measurement
  - 3-1-1 File Retrieve/Save
- 3-2 Setting
  - 3-2-1 Wavelength Input
  - 3-2-2 Equation Input
  - 3-2-3 Unit Setting Modification
- 3-3 Report
- 3-4 Using Mode

## 3-1 Measurement

Photometric Mode (Multi Wavelength Mode)

The Multi-Wavelength mode shows the result of measuring the absorbance of multi-wavelengths and solving the equation.



Fig. 3.1

### Data (Table) Description

Name	Description	Detailed Description
Date	Measured date.	
Time	Measured time.	
#	Measured cell no. or measured cell type.	
Sample name	Sample name.	
Temperature	Temperature of cell box during measurement.	
A1, A2, ...	Absorbance of each wavelength.	A1: Absorbance of the first wavelength, A2: Absorbance of the second wavelength...
E1, E2, ...	Result of input equation.	E1: Result value of the first equation, E2: Result value of the second equation...

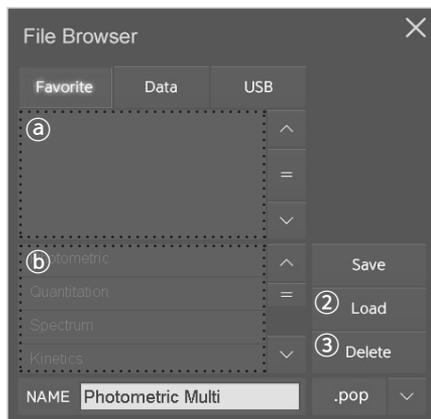
### Description of Main Buttons

Name	Description
File	The stored file is retrieved, or the measured data are saved.
Auto Zero	The blank is measured as the zero point.
Measurement	The measurement sample is inserted and measured.

#### To Retrieve File



Fig. 3.2



**Note**

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space

**[USB]** : Default USB drive

Fig. 3.3 a) Displays the folder list / b) Displays the file list of the folder.

1. Press ① **File**
2. Select the drive from [Favorites], [Data], or [USB] to retrieve the file.
3. Select the ① folder to read from the folder list.
4. Click the ② file to select it to read from the file list.  
Confirm the retrieved file from File Name
5. Retrieve the file by clicking ② **Load**
6. Delete the selected file by clicking ③ **Delete**

## To Save File

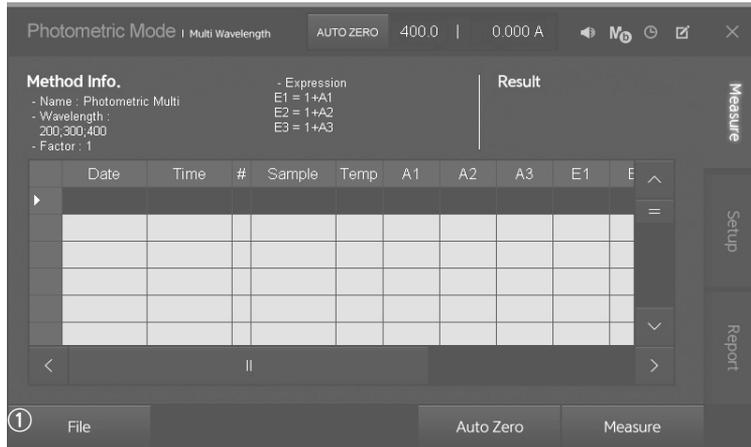


Fig. 3.3

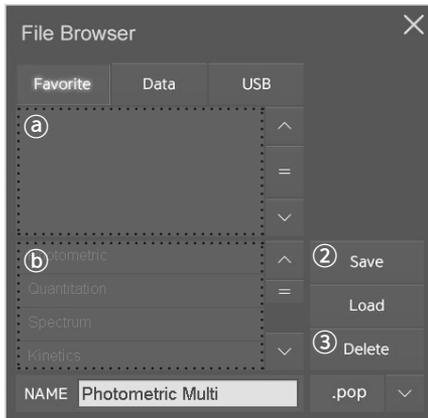


Fig. 3.4 (a) Displays the folder list / (b) Displays the file list of the folder.

**Note****Data Format**

- .pop** : Data format exclusive to the Pop system
- .txt** : Text format
- .csv** : A type compatible with spreadsheet or database
  - \* .csv file is compatible with MS Office Excel

1. Press (1) **File**
2. Select the drive from [Favorites], [Data], or [USB] to save the file.
3. Select the (a) folder to save from the folder list.
4. Enter the file to save in File Name
- \* To overwrite an existing file, click it and confirm the file name.
5. Specify the file format (supported extensions: pop, csv, and txt).
6. Click (2) **Save** to save the file.
7. Click (3) **Delete** to delete the selected file.

## 3-2 Setting

Photometric Mode (Single Wavelength Mode)

This section describes the window for measurement settings.

You can specify the name, cell type, wavelength, dilution multiplication, unit, and memo.

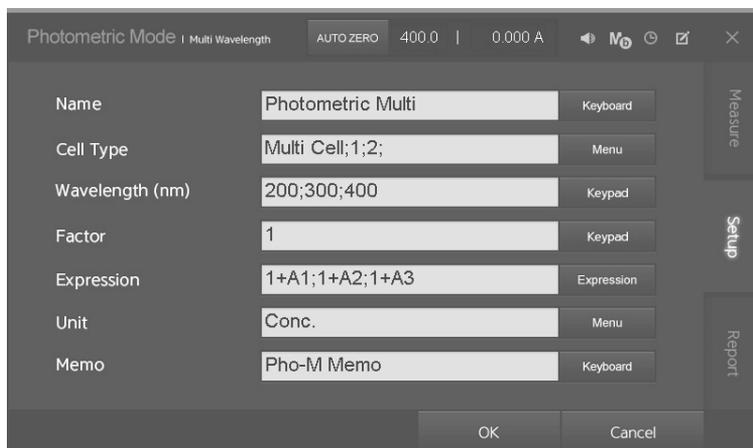


Fig. 3.5

### List of Settings

Name	Description	Detailed Description
Name	Specifies the name of the measured data.	
Cell Type	Selects the cell type to be used.	* Refer to <b>8-1 Cell Type Settings in Ch. 8</b>
Wavelength	Specifies the wavelength to be used.	Default value: 600 nm, Operating range: 190 - 1100 nm
Dilution Multiplication	Enters the dilution multiplication or other factors to obtain the concentration value reflecting the factor.	
Equation	The absorbance (A1 - A8) measured from the specified wavelength is calculated using the equation (E1 - E3) manually entered by the user.	You can specify up to three equations.
Unit	Select the unit to be used.	* Refer to <b>3-2-3 Unit Setting in Ch. 3</b>
Memo	Enters the memo if needed.	

## 3-2-1 Wavelength Input

Photometric Mode (Multi Wavelength Mode)

Ch.3

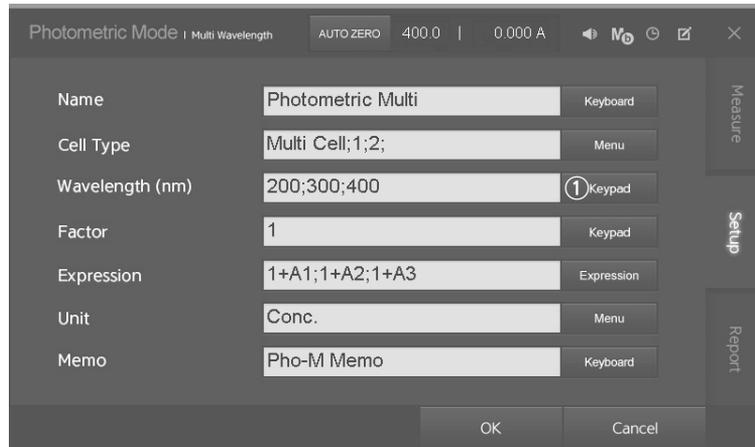


Fig. 3.6

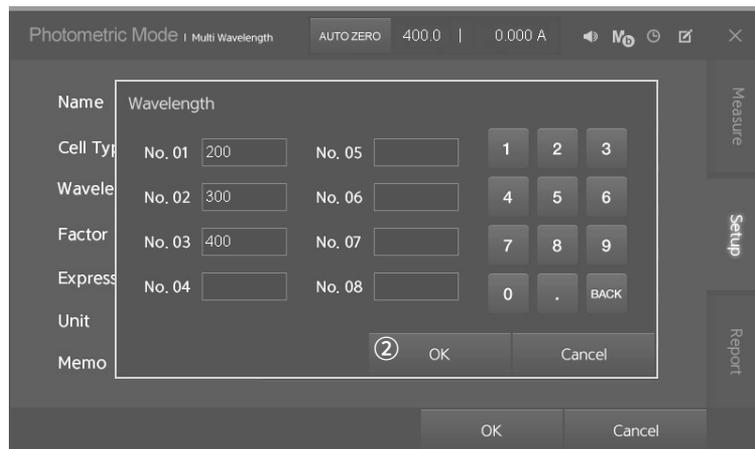


Fig. 3.7

1. Click ① **Keypad** in the list of the Settings page.
2. [Figure 2] Enter the wavelengths to measure using the numeric keypad.
3. The acceptable wavelength range is 190 - 1100 nm with the first decimal place, and you can enter up to 8 values.
4. Click ② **OK** after entering the wavelengths.

## 3-2-2 Equation Input

Photometric Mode (Multi Wavelength Mode)

Ch.3

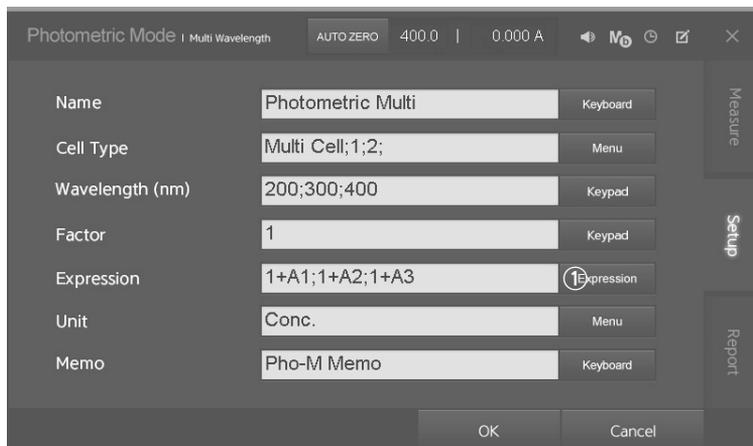


Fig. 3.8



Fig. 3.9

1. Click ① **Expression** in the list of the Settings page.
2. [Figure 2] Enter the equation using the numeric keypad. A means the absorbance. A1 means the absorbance of the wavelength 1 while A2 means the absorbance of the wavelength 2.
3. You can insert the symbols like +, -, x, and / and the parenthesis into the equation.
4. Click ② **OK** after entering the equation.

### 3-2-3 Unit setting

Photometric Mode (Multi Wavelength Mode)

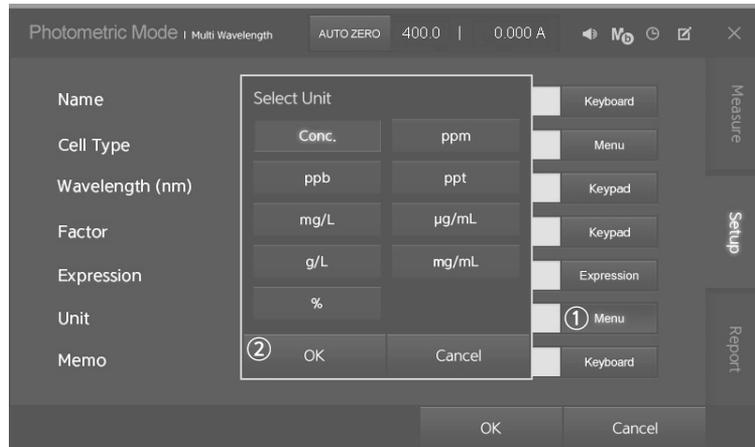


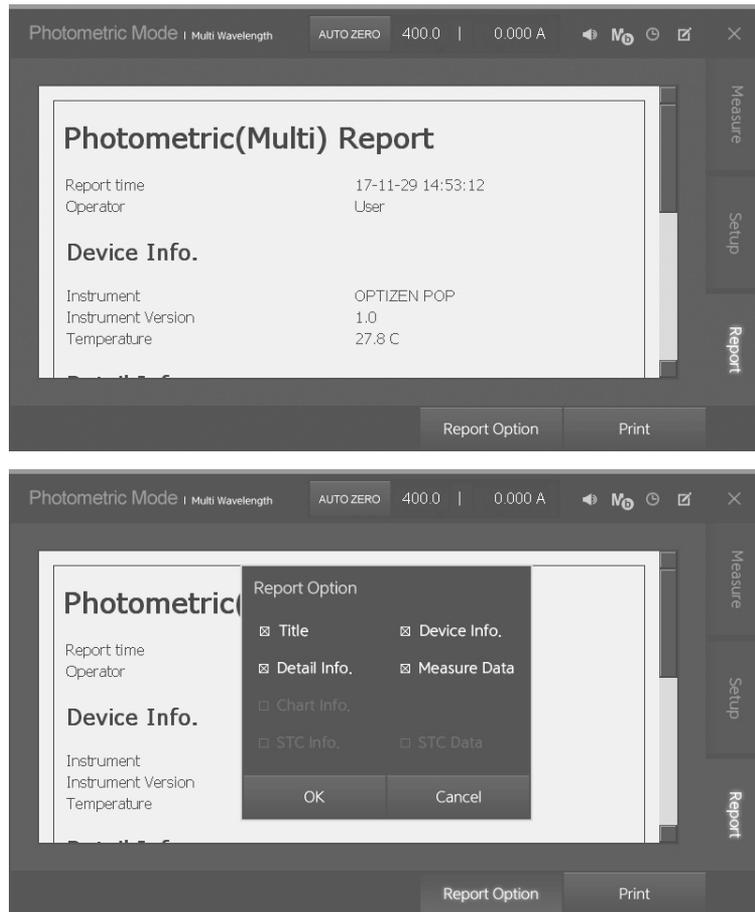
Fig. 3.10

1. Click ① **Menu** in the list of the Settings page.
2. Select the unit to be used.
3. Click ② **OK** to apply the selection.

## 3-3 Report

Photometric Mode (Multi Wavelength Mode)

You can preview the selected data, select a section, and print it.



Ch.3

Fig. 3.11

### Detailed Description

Name	Description
Report Setting	Selects the content to print and prints it.
Print	Print

Name	Description
Device Info.	Shows the equipment information and the usage time of D2 and W Lamp.
Detail Info.	Shows the settings of Photometric Mode.
Measure Data	Shows the measured data of Photometric Mode.

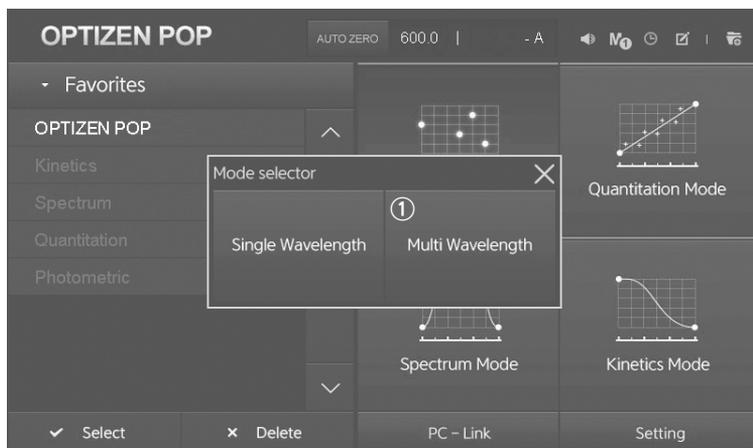


Fig. 3.12



Fig. 3.13

1. [Figure 1] Select ① **Multi Wavelength** Mode on the main page.
2. [Figure 2] Move to the ② <Setup> tab and specify the measurement settings.

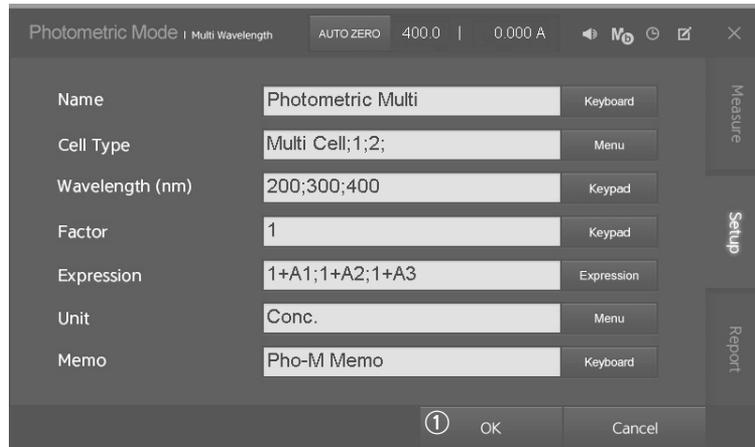


Fig. 3.14



Fig. 3.15

3. [Figure 3] Click ① **OK** after selecting and entering the name, cell type, wavelength, dilution multiplication, equation, unit, and memo.
4. The display moves to <Measure> tab [Figure 4] automatically.
5. [Figure 4] Run ② **Auto Zero** after inserting a blank in the selected cell holder.
6. [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder after Auto Zero is run.
7. [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder if there is an additional sample.
8. You can check the measured data in a table form.

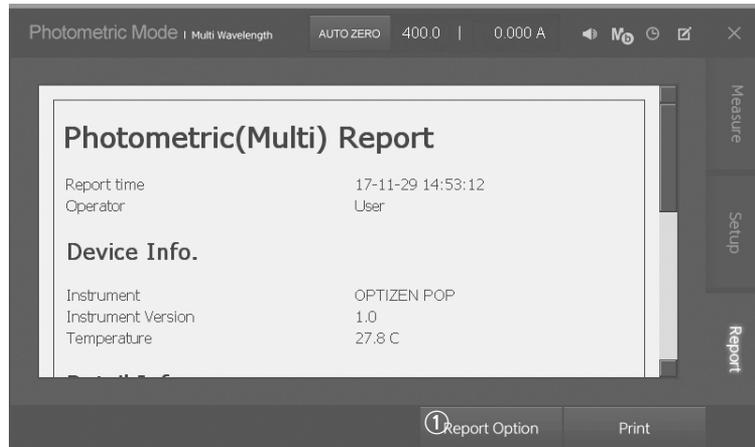


Fig. 3.16

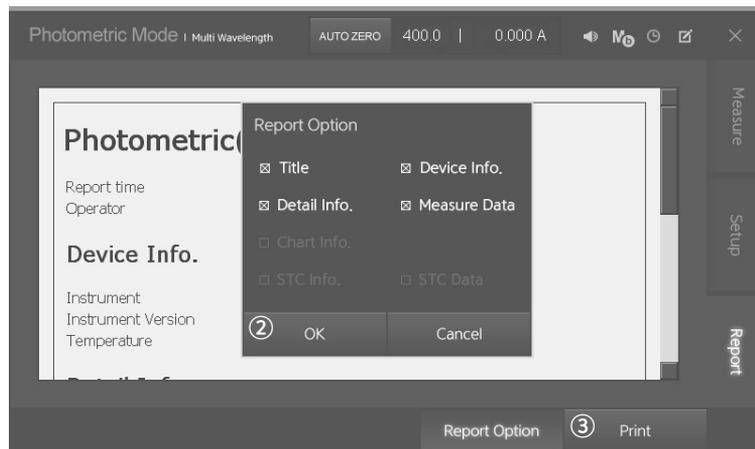


Fig. 3.17

9. Move to the <Report> tab to check or print the measured data in a report format.

10. [Figure 6] Click **1** **Report Option**, select the items to be included in the report, and click **2** **OK**

11. The STC (Standard Curve Info.) information is not applicable and thus is not displayed.

12. Check the contents to be printed and click **3** **Print** to print them.

# Ch. 4

## Quantitation Mode

- 4-1 Description of Quantitation Mode
- 4-2 Calibration Curve Manager
  - 4-2-1 Main Page
  - 4-2-2 File Import/Export
- 4-3 Calibration Curve Mode
  - 4-3-1 Measurement
  - 4-3-2 Setting
  - 4-3-3 Unit Setting
  - 4-3-4 Report
- 4-4 Using Mode (Standard Curve Generation)

## 4-1 Description of Quantitation Mode

The mode measures the absorbance of a standard specimen with known concentration to create the standard curve. You can measure the concentration by applying the standard curve to Quantitation Mode.

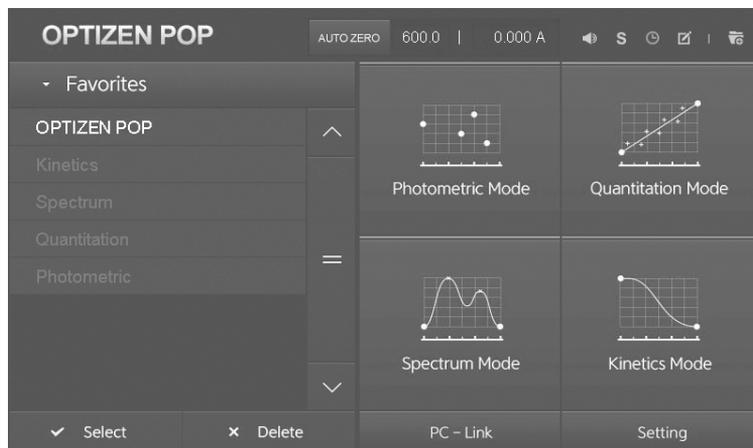


Fig. 4.1

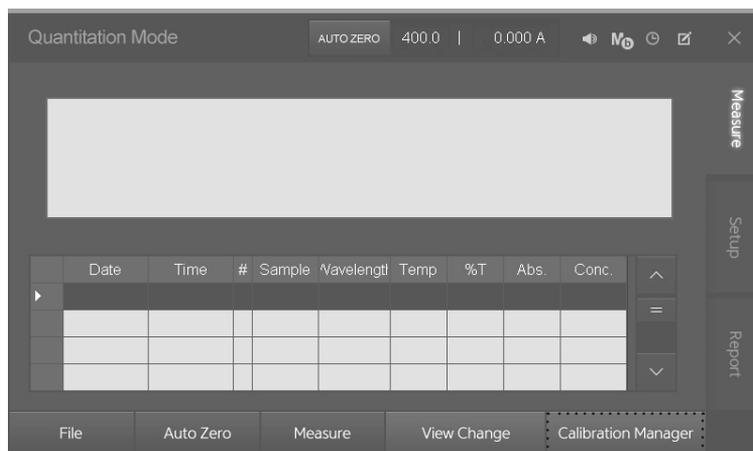


Fig. 4.2

Select Quantitation Mode on the main page and click the ① Calibration Manager button to enter Calibration Curve Manager and create the standard curve and modify it.

\* Refer to 4-2 Calibration Curve Manager of Ch. 4 for more details of Calibration Manager.

## 4-2 Calibration Curve Manager

Quantitation Mode

### 4-2-1 Main Page

You can select, create, modify, or delete a standard curve and retrieve or export a standard curve from or to an external storage unit on this page.

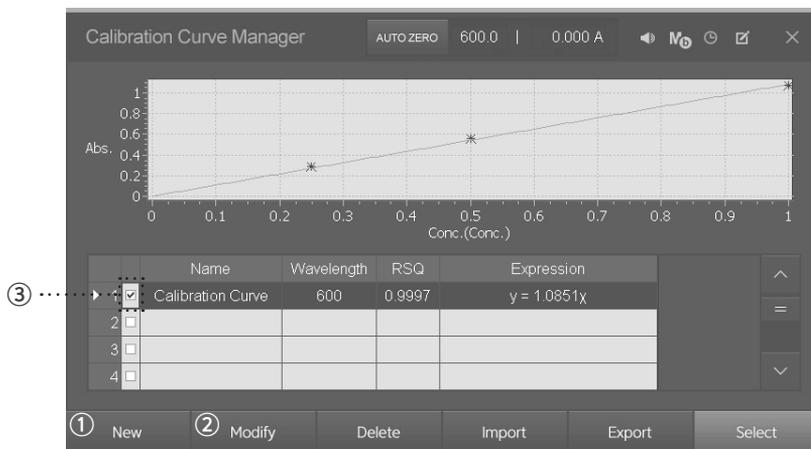


Fig. 4.3

Click **1** **New** or **2** **Modify** to move to Calibration Curve Mode and create a new standard curve or modify an existing standard curve.

\* Check (v) **3** to check the data (graph, RSQ value, calibration curve, etc.) of the standard curve.

\* You can use the tools such as [Import], [Export], [Delete], or [Select] (on connecting to Quantitation Mode) after checking (v) **3**.

Name	Description
Create New	Creates a new standard curve.
Modify	Checks and modifies the stored standard curve.
Delete	Deletes the checked standard curve.
Import	Imports the standard curve file stored in the external storage unit into the list.
Export	Exports the stored standard curve file to the external storage unit.
Select	Applies the selected calibration curve to Quantitation Mode.

Ch.4

## File Import

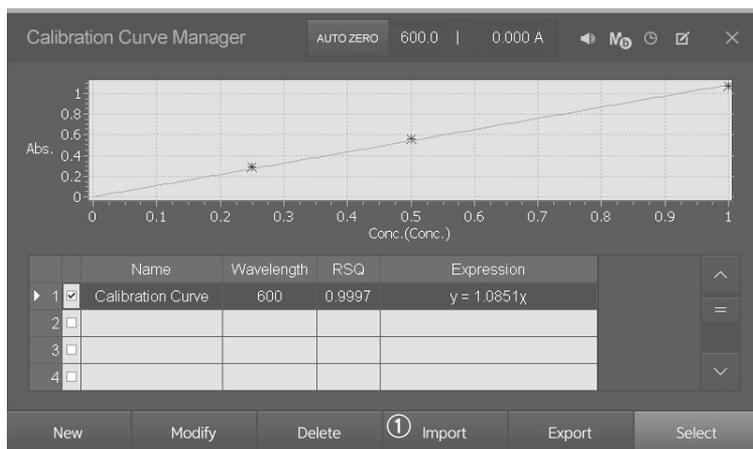
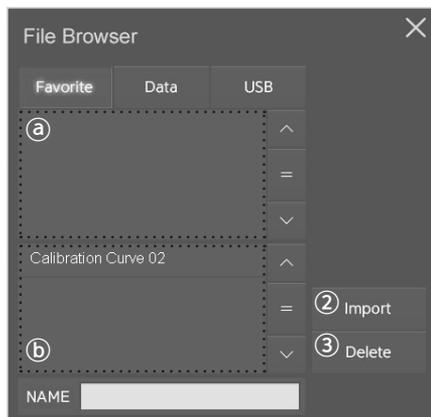


Fig. 4.4

**Note**

Favorite    Data    USB

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space

**[USB]** : Default USB drive

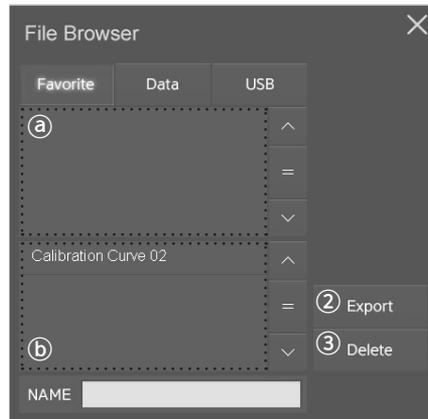
Fig. 4.5 (a) Displays the folder list / (b) Displays the file list of the folder.

1. Press **1** **Import**
2. Select the drive from [Favorites], [Data], or [USB] to retrieve the file.
3. Select the **a** folder to read from the folder list.
4. Click the **b** file to select it to read from the file list.  
Confirm the retrieved file from File Name
5. Import the file by clicking **2** **Import**
6. Click **3** **Delete** to delete the selected file.

## File Export



Fig. 4.6



- ① Displays the folder list  
 ② Displays the file list of the folder.

Fig. 4.7

1. Press ① **Export**
  2. Select the drive from [Favorites], [Data], or [USB] to save the file.
  3. Select the ① folder to save from the folder list.
  4. Enter the file to save in File Name
- \* To overwrite an existing file, click it and confirm the file name.
6. Click ② **Export** to save the file.
  7. Click ③ **Delete** to delete the selected file.

## 4-3 Calibration Curve Mode

Quantitation Mode > Calibration Curve Mode

### 4-3-1 Measurement

Enter the concentrations of specimens in order and make the measurement to create the standard curve.

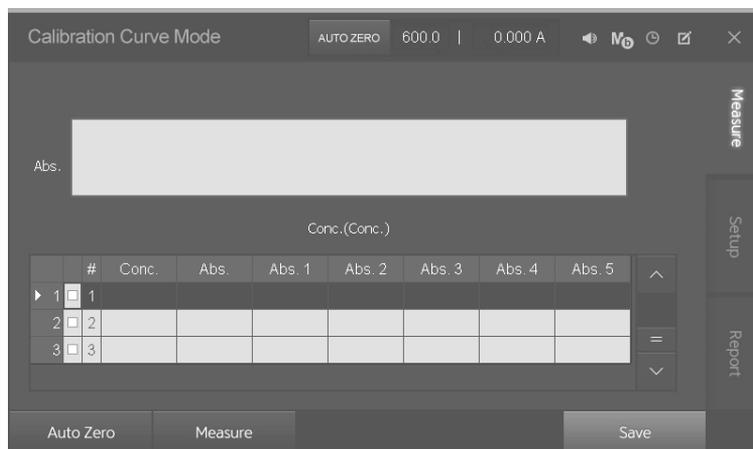


Fig. 4.8

#### \* To Enter Concentration

The keyboard is automatically created when you select the chart (table) cell. Enter the concentration using the keyboard.

Name	Description	Remark
Auto Zero	The blank is measured as the zero point.	In the case of a MultiCell, the same number of concentrations as the entered number can be measured at a time.
Measurement	Inserts the measurement sample and measures it.	
Save	Creates the standard curve by applying the measured data after the measurement.	

## 4-3-2 Setting

Specifies the measurement settings.

Specifies the name, cell type, wavelength, standard curve type, count, unit, and memo.

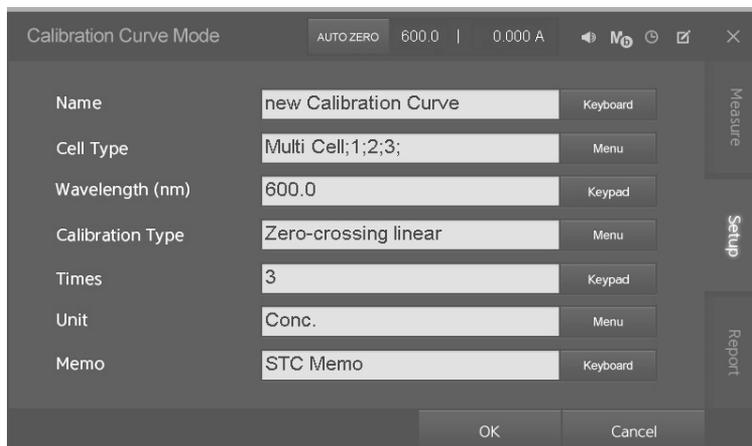


Fig. 4.9

### List of Settings

Name	Description	Detailed Description
Name	Specifies the name of the measured data.	
Cell Type	Selects the cell type to be used.	* Refer to <b>8-1 Cell Type Settings in Ch. 8</b>
Wavelength	Specifies the wavelength to be used.	Default value: 600 nm, Operating range: 190 - 1100 nm
Calibration Type	Selects the type of the standard curve.	The primary line, secondary curve, or tertiary curve that passes through the origin point can be selected.
Times	Enters the number of measurements per sample.	Up to 5 can be selected.
Unit	Selects the unit to be used.	* Refer to <b>3-2-3 Unit Setting in Ch. 3</b>
Memo	Enters the memo if needed.	

## 4-3-3 Unit setting

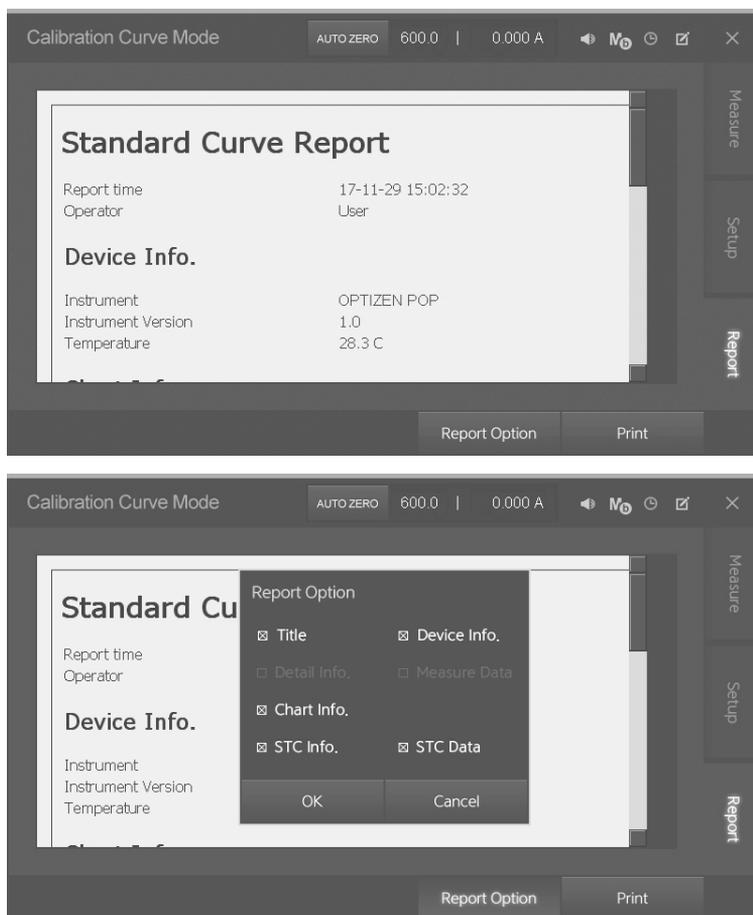
Quantitaton Mode > Calibration Curve Mode



Fig. 4.10

1. Click ① **Menu** in the list of the Settings page.
2. Select the unit to be used.
3. Click ② **OK** to apply the selection.

## 4-3-4 Report



Ch.4

Fig. 4.11

### Detailed Description

Name	Description
Report Setting	Selects the content to print and prints it.
Print	Print

Name	Description
Device Info.	Shows the equipment information and the usage time of D2 and W Lamp.
Chart Info.	Shows the STC calibration curve graph.
STC Info.	Shows the STC settings.
STC Data	Shows the STC data.

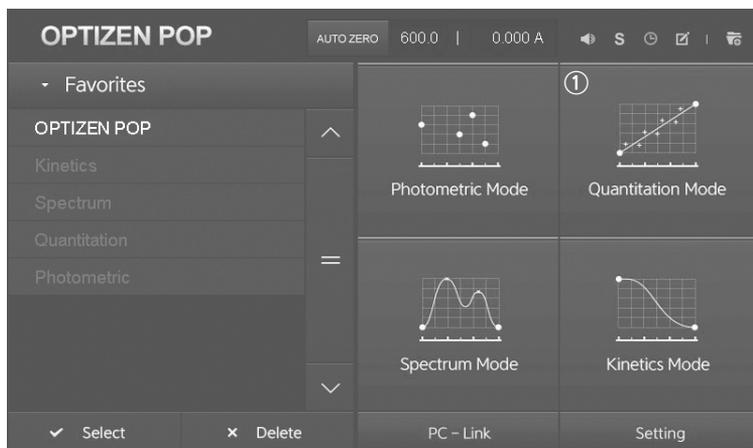


Fig. 4.12

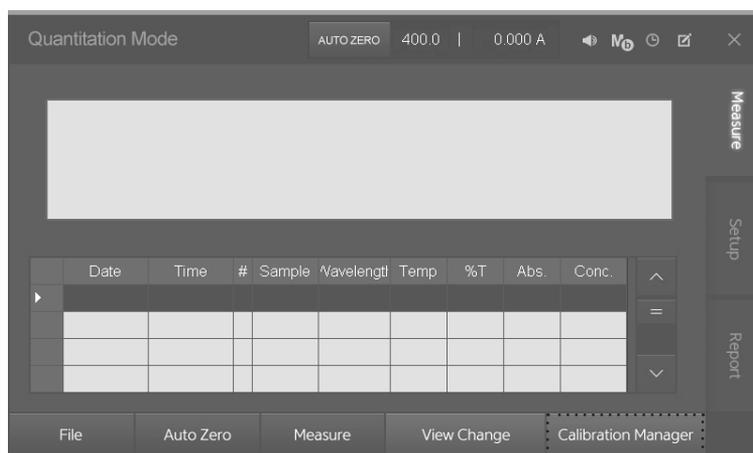


Fig. 4.13

1. [Figure 1] Select ① **Quantitation Mode**
2. [Figure 2] Select ② **Calibration Manager** in Quantitation Mode to move to Calibration Curve Manager.

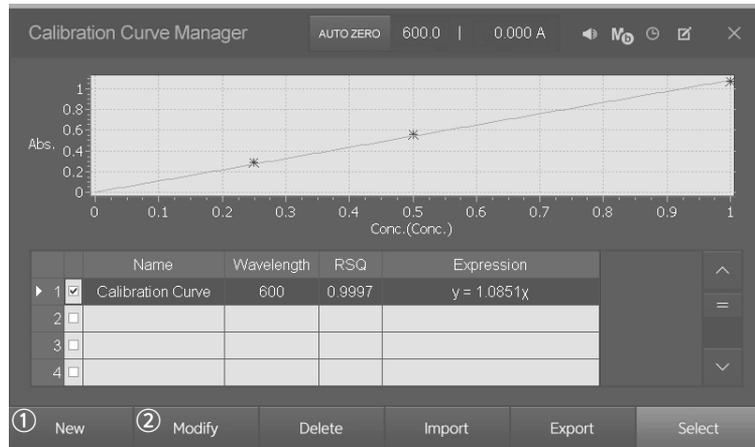


Fig. 4.14

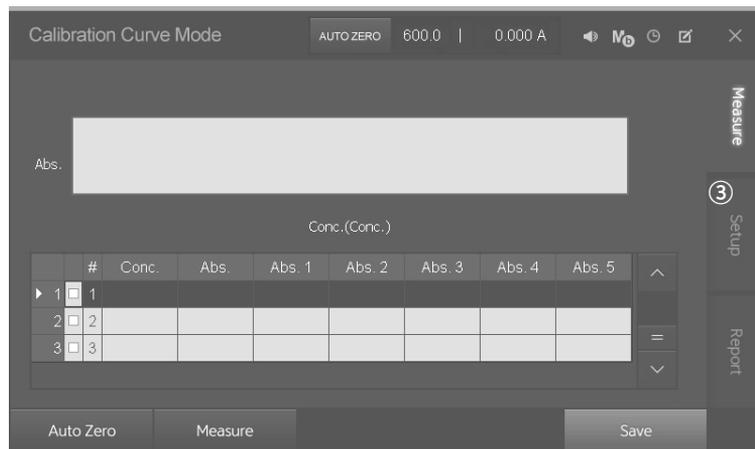


Fig. 4.15

3. [Figure 3] Select ① **New** to create a new standard curve in the Calibration Curve Manager page or ② **Modify** to modify the existing standard curve. The display moves to Calibration Curve Mode.
4. [Figure 4] Move to ③ **<Setup>** tab in Calibration Curve Mode and specify the measurement settings.

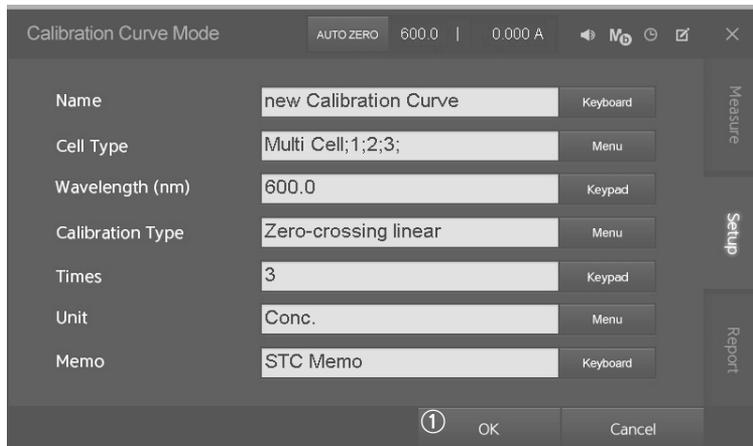


Fig. 4.16

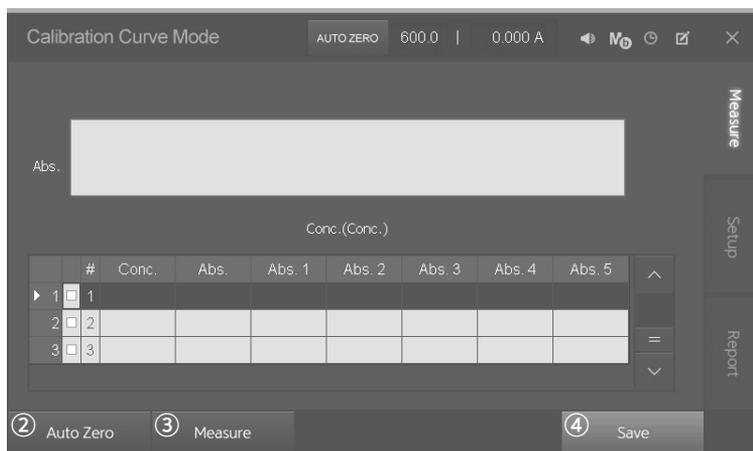


Fig. 4.17

- [Figure 5] Click ① **OK** after selecting and entering the name, cell type, wavelength, standard curve type, count, unit, and memo.
- The display moves to <Measure> tab [Figure 6] automatically.
- The keyboard automatically appears when you click the cell to enter the concentration. Enter the concentration of the standard.
- [Figure 6] Run ② **Auto Zero** after inserting a blank in the selected cell holder.
- [Figure 6] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder after Auto Zero is run.
- [Figure 6] Select ④ **Save** to create a calibration curve in the selected standard curve type and check the chart, calibration curve equation, and RSQ value.

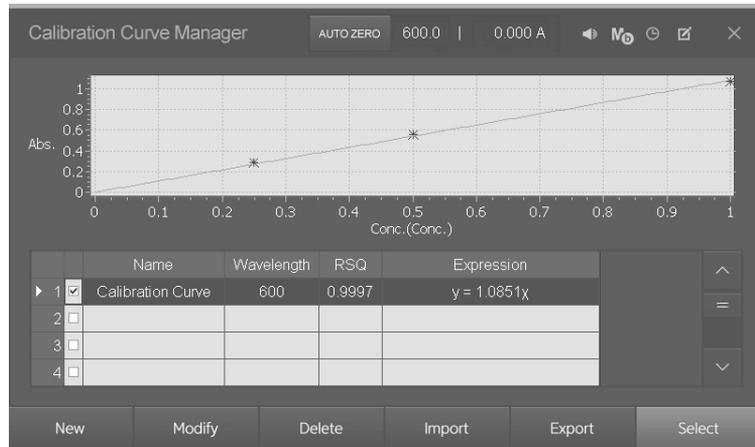


Fig. 4.18

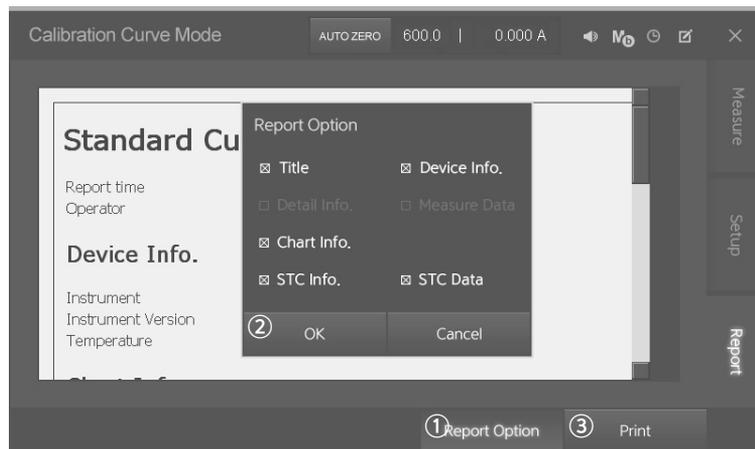


Fig. 4.19

11. [Figure 7] Uncheck the measured data not to be included in the calibration curve.
12. [Figure 8] Move to the <Report> tab to check or print the measured data in a report format.
13. Click ① **Report Option**, select the items to be included in the report, and click ② **OK**
14. Check the contents to be printed and click ③ **Print** to print them.

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# Ch. 5

## Spectrum Mode

- 5-1 Mode Main Page
  - 5-1-1 File Retrieve/Save
  - 5-1-2 Screen Switch (View Graph)
- 5-2 Setting
- 5-3 Report
- 5-4 Using Mode

## 5-1 Spectrum Mode Main Page

Spectrum Mode

This mode scans the selected cell of the specified wavelength band in the specified step interval and displays it in a chart or table form. It is used to search the absorbance and transmittance in each wavelength.

### Measurement screen

You can scan the selected cell of the specified wavelength band in the specified step interval.



Fig. 5.1

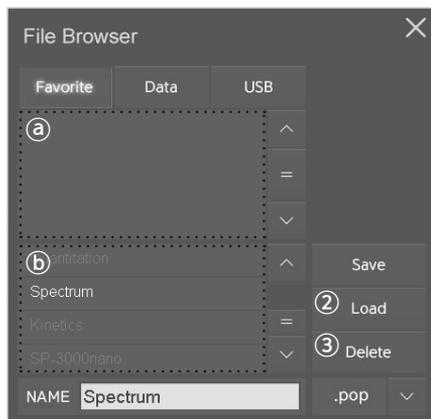
### Detailed Description

Name	Description
File	The stored file is retrieved, or the measured data are saved.
Baseline	The blank of the wavelength is specified as the zero point before the measurement.
Measurement	Inserts the measurement sample and measures it.
Delete	Deletes the checked data after the measurement.
Screen Switch	Shows the data in three formats of graph + data, graph, or data.

## To Retrieve File



Fig. 5.2

**Note**

**Favorite**   **Data**   **USB**

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space.

**[USB]** : Default USB drive.

Fig. 5.3 (a) Displays the folder list / (b) Displays the file list of the folder.

1. Press **1** **File**
2. Select the drive from [Favorites], [Data], or [USB] to retrieve the file.
3. Select the **a** folder to read from the folder list.
4. Click the **b** file to select it to read from the file list.  
Confirm the retrieved file from File Name
5. Retrieve the file by clicking **2** **Load**
6. Delete the selected file by clicking **3** **Delete**

## To Save File



Fig. 5.4

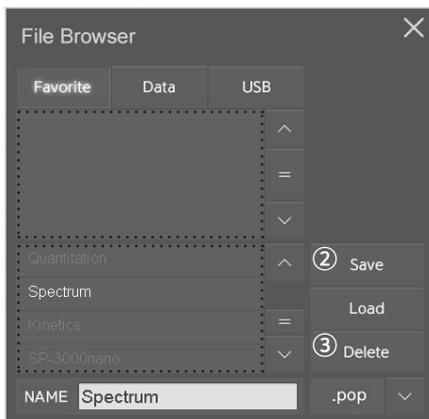


Fig. 5.5 (a) Displays the folder list / (b) Displays the file list of the folder.

**Note****Data Format**

**.pop** : Data format exclusive to the Pop system .

**.txt** : Text format.

**.csv** : A type compatible with spreadsheet or database

\* .csv file is compatible with MS Office Excel.

1. Press (1) **File**
  2. Select the drive from [Favorites], [Data], or [USB] to save the file.
  3. Select the (a) folder to save from the folder list.
  4. Enter the file to save in File Name
- \* To overwrite an existing file, click it and confirm the file name.
5. Specify the file format (supported extensions: pop, csv, and txt).
  6. Save the file by clicking (2) **Save**
  7. Click (3) **Delete** to delete the selected file.

## 5-1-2 Screen Switch

Spectrum Mode

You can use the Zoom in/out, Graph move, %T/ABS selection, and Peak/Valley functions after selecting View Graph.

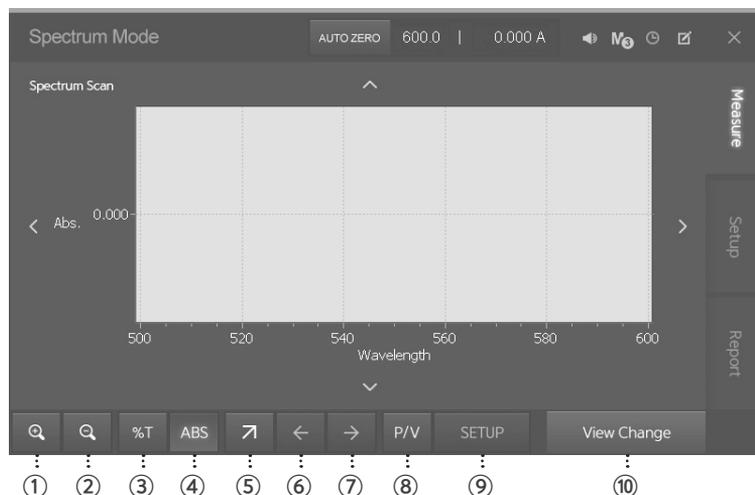


Fig. 5.6

### Button List

Button	Name	Detailed Description
①	Zoom in	Magnifies the chart.
②	Zoom out	Contracts the chart (to return to the original size).
<	Left	Moves the chart to the left.
>	Right	Moves the chart to the right.
^	Up	Moves the chart up.
v	Down	Moves the chart down.
③	%T	Converts the data form to transmittance.
④	ABS	Converts the data form to absorbance.
⑤	Cursor	Displays absorbance (transmittance) value and wavelength value on the point of the cursor when the user presses Cursor while the Peak and Valley are displayed.
⑥	Cursor to left	Moves the cursor to the left.
⑦	Cursor to right	Moves the cursor to the right.
⑧	Peak/Valley	Displays the Peak point and Valley point on the graph.
⑨	Peak/Valley Setup	Modifies the settings of Peak and Valley.
⑩	Screen Switch	Shows the data in three formats of graph + data, graph, or data.

Ch.5

You can specify the name, cell type, beginning wavelength, end wavelength, interval, memo, and process mode.

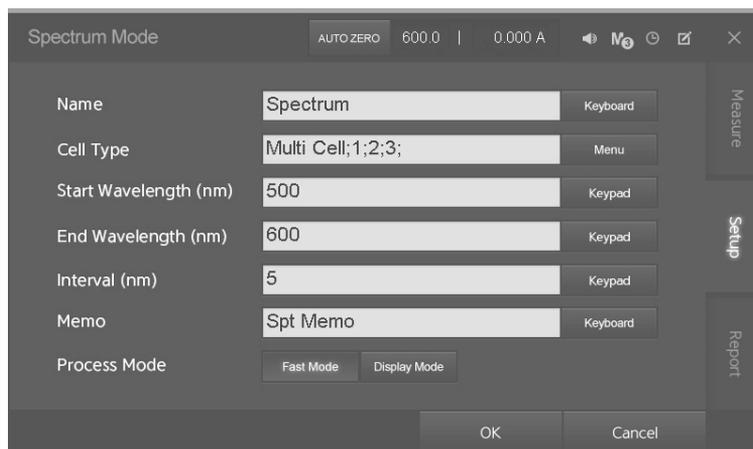


Fig. 5.7

### List of Settings

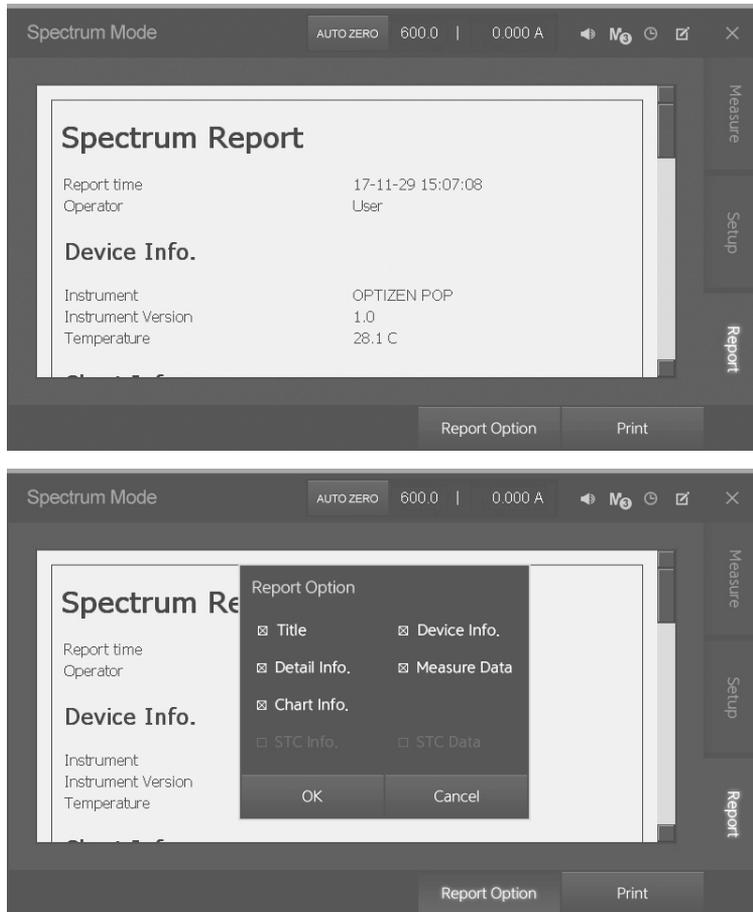
Name	Description	Detailed Description
Name	Specifies the name of the measured data.	
Cell Type	Selects the cell type to be used.	* Refer to <b>8-1 Cell Type Settings in Ch. 8</b>
Start Wavelength	Specifies the wavelength to begin scanning.	Default value: 600 nm, Operating range: 190 - 1100 nm
End Wavelength	Specifies the wavelength to end scanning.	Default value: 600 nm, Operating range: 190 - 1100 nm
Interval	Specifies the scan wavelength interval.	
Memo	Enters the memo if needed.	

#### **i** Note

##### Process Mode

**Fast Mode**, The mode does not use the Process Bar and displays the data at once after the measurement. Although the measurement progress cannot be checked, the measurement is fast and cannot be canceled until it is completed.

**Display Mode**, The mode uses the Process Bar, and thus you can check the progress of the measurement with the Process Bar. You can cancel the measurement using the Cancel before the measurement is completed.



Ch.5

Fig. 5.8

Detailed Description

Name	Description
Report Setting	Selects the content to print and prints it.
Print	Print

Name	Description
Device Info.	Shows the equipment information and the usage time of D2 and W lamp.
Detail Info.	Shows the Spectrum calibration curve graph.
Measure Data	Shows the settings of Spectrum Mode.
Chart Info.	Shows the Spectrum data.

Ch.5

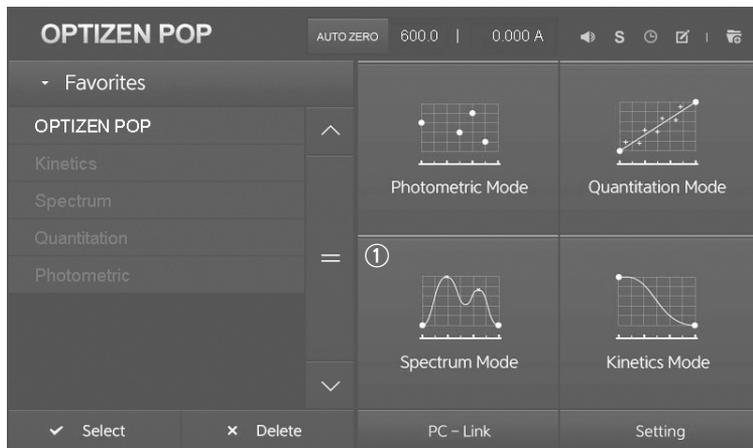


Fig. 5.9



Fig. 5.10

1. [Figure 1] Select ① **Spectrum Mode** on the main page.
2. [Figure 2] Move to the ② <Setup> tab and specify the measurement settings.

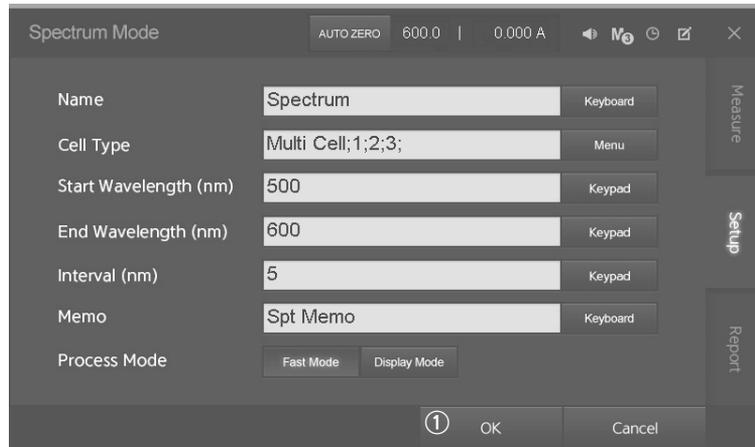


Fig. 5.11

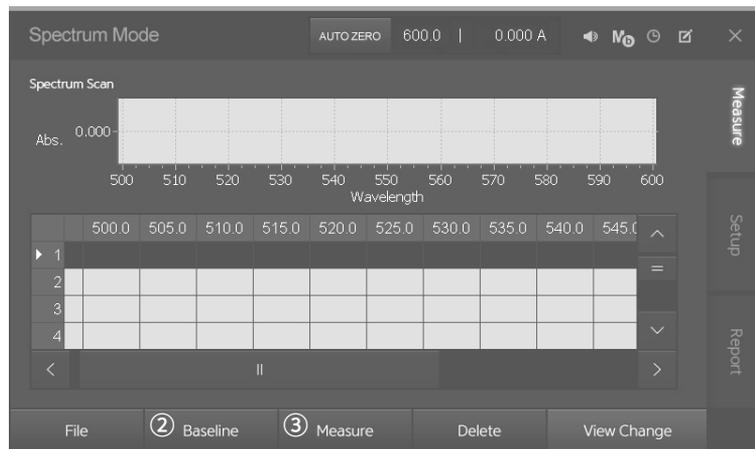


Fig. 5.12

3. [Figure 3] Click ① **OK** after selecting and entering the name, cell type, start wavelength, end wavelength, interval, memo, and Process Mode.
4. The display moves to <Measure> tab [Figure 4] automatically.
5. [Figure 4] Run ② **Baseline** after inserting the blank into the cell holder.
6. [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder after Auto Zero is run.
7. [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder if there is an additional sample.
8. You can check the measured data in a graph or table form.

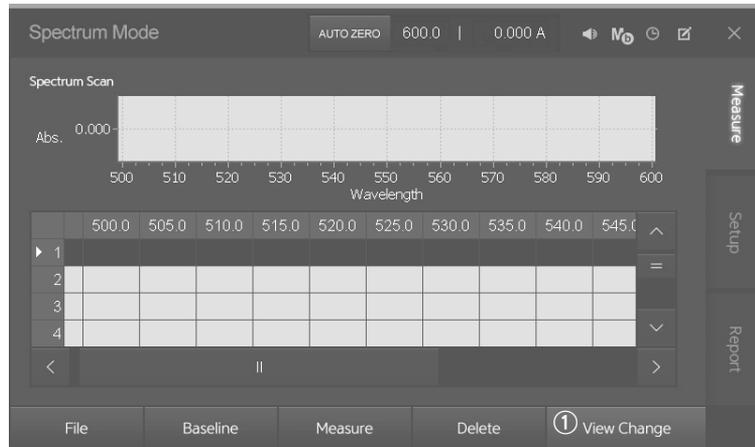
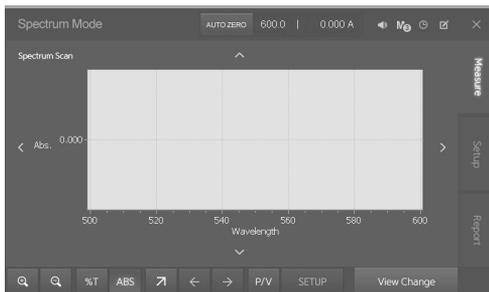


Fig. 5.13

9. Click ④ **View Change** to select Graph+Data, Graph, or Data.

**Note**



\* Please refer to **Section 5-1-2 Switch Screen in Ch. 5** for more detailed information on View Graph page.

Fig. 5.14 View Graph Page



Fig. 5.15 View Data Page

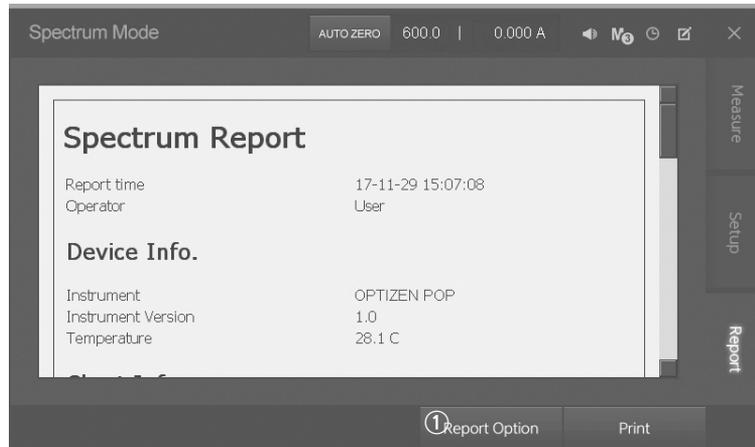


Fig. 5.16

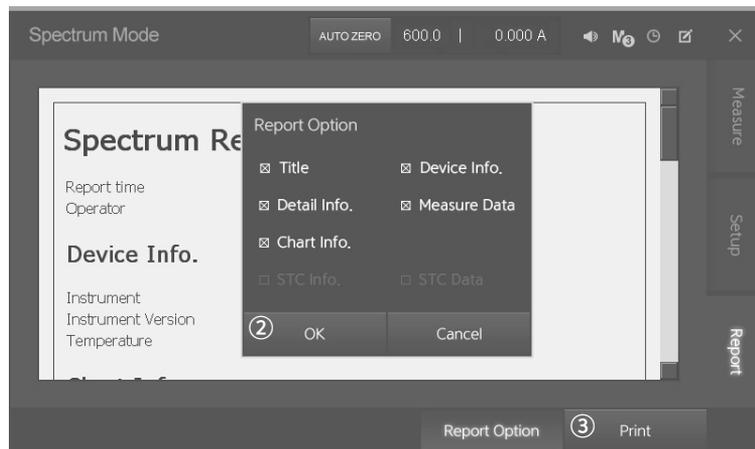


Fig. 5.17

9. Move to the <Report> tab to check or print the measured data in a report format.

10. [Figure 6] Click **1** **Report Option**, select the items to be included in the report, and click **2** **OK**

12. Check the contents to be printed and click **3** **Print** to print them.

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# Ch. 6

## Kinetics Mode

- 6-1 Mode Main Page
  - 6-1-1 File Retrieve/Save
  - 6-1-2 Screen Switch (View Graph)
- 6-2 Setting
- 6-3 Report
- 6-4 Using Mode

## 6-1 Kinetics Mode Main Page

Kinetics Mode

The mode shows the concentration change of specimen with time. It is convenient for measuring the currently reacting specimen. The measured data are available in a chart or table form.

### Measurement Page

You can measure the concentration change of specimen with time.

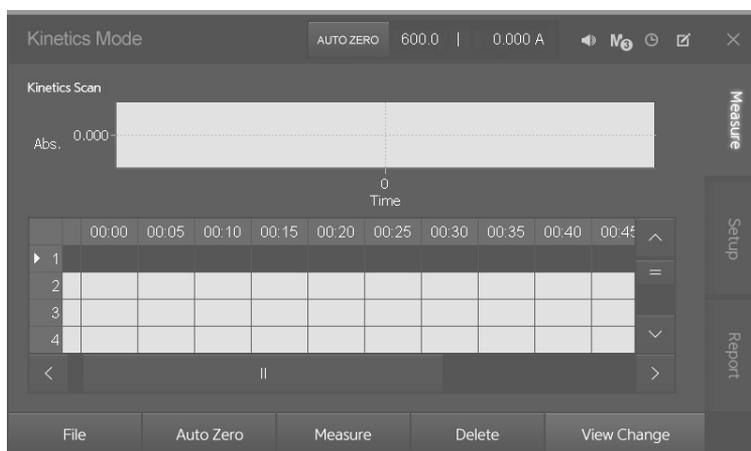


Fig. 6.1

### Detailed Description

Name	Description
File	The stored file is retrieved, or the measured data are saved.
Auto Zero	The blank is measured as the zero point.
Measurement	Inserts the measurement sample and measures it.
Delete	Deletes the checked data after the measurement.
Screen Switch	Shows the data in three formats of graph+data, graph, or data.

## To Retrieve File



Fig. 6.2

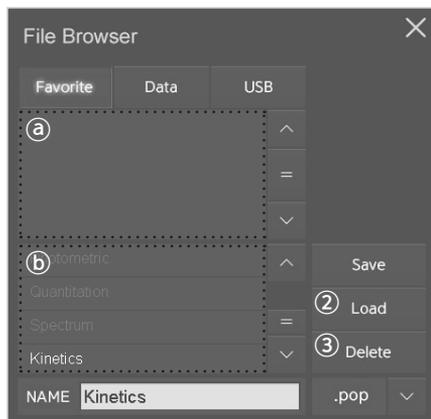


Fig. 6.3 (a) Displays the folder list / (b) Displays the file list of the folder.

**Note**

Favorite    Data    USB

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space.

**[USB]** : Default USB drive.

1. Press **1** **File**
2. Select the drive from [Favorites], [Data], or [USB] to retrieve the file.
3. Select the **a** folder to read from the folder list.
4. Click the **b** file to select it to read from the file list.  
Confirm the retrieved file from File Name.
5. Retrieve the file by clicking **2** **Load**
6. Delete the selected file by clicking **3** **Delete**

## To Save File



Fig. 6.4

Ch.6

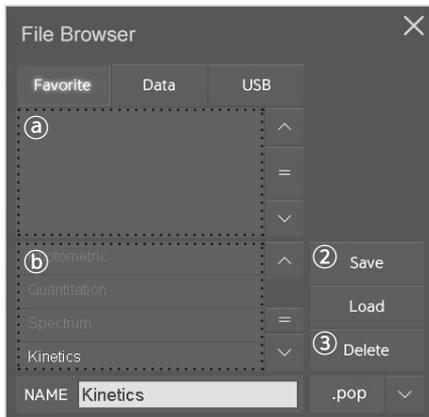


Fig. 6.5 (a) Displays the folder list / (b) Displays the file list of the folder.

### Note

#### Data Format

**.pop** : Data format exclusive to the Pop system .

**.txt** : Text format.

**.csv** : A type compatible with spreadsheet or database

\* .csv file is compatible with MS Office Excel

1. Press ① **File**
2. Select the drive from [Favorites], [Data], or [USB] to save the file.
3. Select the ① folder to save from the folder list.
4. Enter the file to save in File Name
- \* To overwrite an existing file, click it and confirm the file name.
5. Specify the file format (supported extensions: pop, csv, and txt).
6. Save the file by clicking ② **Save**
7. Click ③ **Delete** to delete the selected file.

## 6-1-2 Screen Switch

Kinetics Mode

You can use the Zoom in/out, Graph move, and %T/ABS selection functions after selecting View Graph.



Fig. 6.6

### Button List

Button	Name	Detailed Description
①	Zoom in	Magnifies the chart.
②	Zoom out	Contracts the chart (to return to the original size) .
<	Left	Moves the chart to the left.
>	Right	Moves the chart to the right.
^	Up	Moves the chart up.
v	Down	Moves the chart down.
③	%T	Converts the data form to transmittance.
④	ABS	Converts the data form to absorbance.
⑤	Cursor	Displays absorbance (transmittance) value and wavelength value on the point of the cursor when the user presses Cursor while the Peak and Valley are displayed.
⑥	Cursor to left	Moves the cursor to the left.
⑦	Cursor to right	Moves the cursor to the right.
⑧	View Change	Shows the data in three formats of graph+data, graph, or data.

Ch.6

## 6-2 Settings

Kinetics Mode

Specifies the measurement settings.

Specifies the name, cell type, wavelength, total time, interval, and memo.

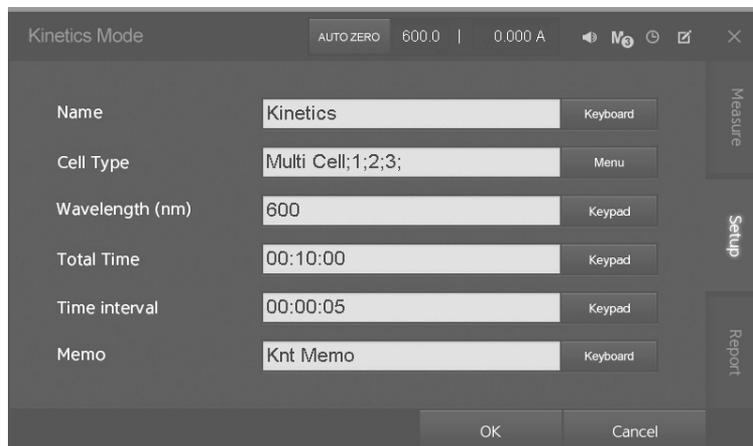


Fig. 6.7

### List of Settings

Name	Description	Detailed Description
Name	Specifies the name of the measured data.	
Cell Type	Selects the cell type to be used.	* Refer to <b>8-1 Cell Type Settings in Ch. 8</b>
Wavelength	Specifies the wavelength to be used.	Default value: 600 nm, Operating range: 190 - 1100 nm
Total Time	Specifies the total measurement time.	
Interval	Specifies the scan wavelength interval.	
Memo	Enters the memo if needed.	

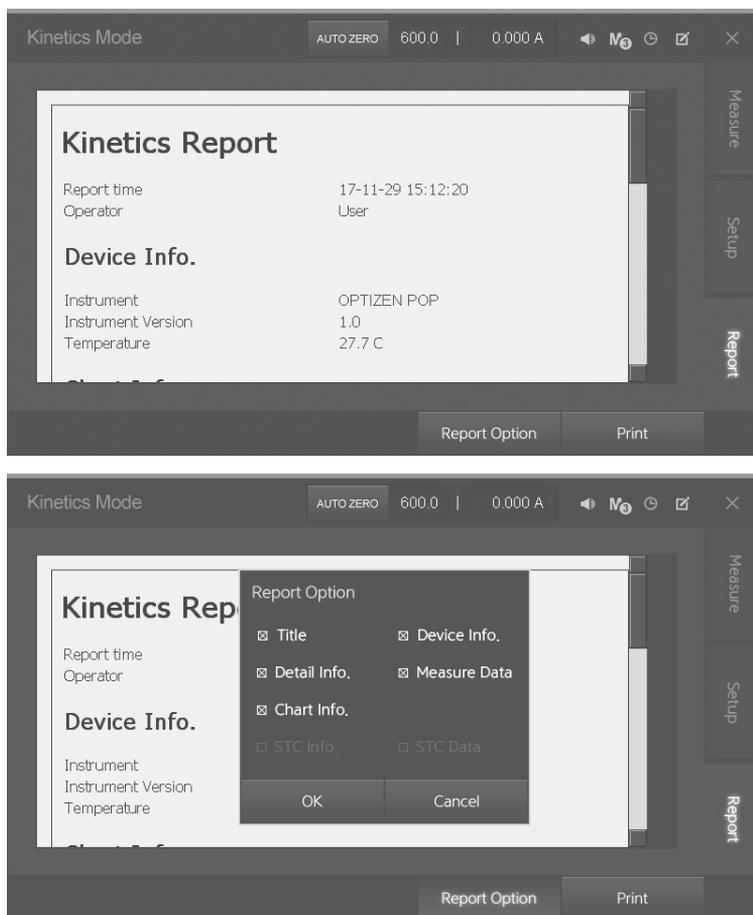


Fig. 6.8

Detailed Description

Name	Description
Report Setting	Selects the content to print and prints it.
Print	Print

Name	Description
Device Info.	Shows the equipment information and the usage time of D2 and W lamp.
Detail Info.	Shows the Kinetics calibration curve graph.
Measure Data	Shows the settings of Kinetics Mode.
Chart Info.	Shows the Kinetics data.

Ch.6

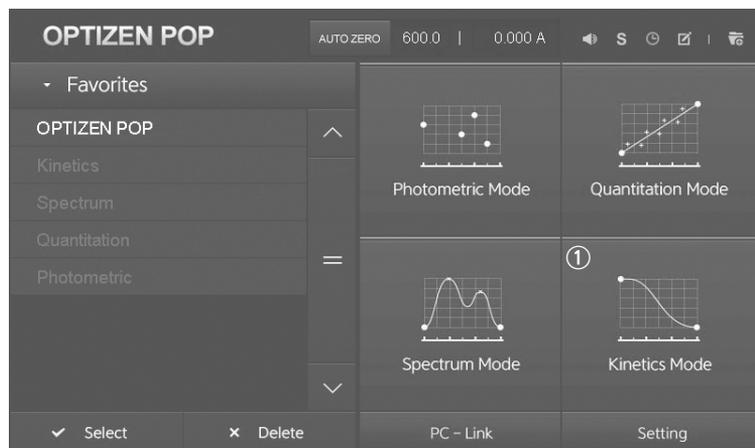


Fig. 6.9

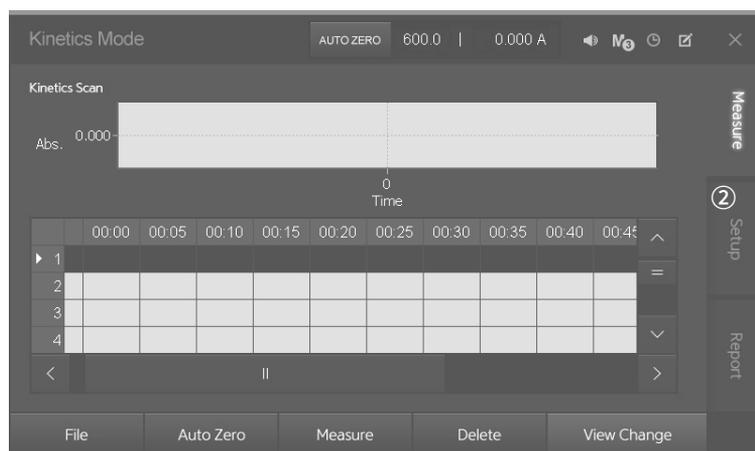


Fig. 6.10

1. [Figure 1] Select ① **Kinetics Mode** on the main page.
2. [Figure 2] Move to the ② <Setup> tab and specify the measurement settings.

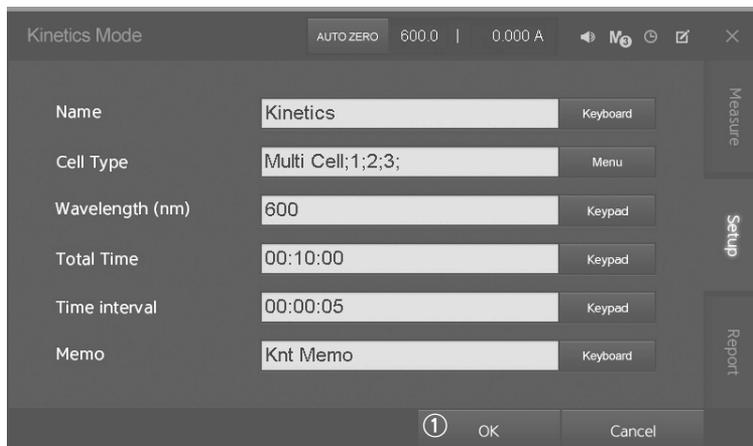


Fig. 6.11



Fig. 6.12

- [Figure 3] Click ① **OK** after selecting and entering the name, cell type, wavelength, total time, time interval, and memo.
- The display moves to <Measure> tab [Figure 4] automatically.
- [Figure 4] Run ② **Auto Zero** after inserting a blank in the selected cell holder.
- [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder after Auto Zero is run.
- [Figure 4] Click ③ **Measure** after inserting the sample to be measured in the selected cell holder if there is an additional sample.
- You can check the measured data in a graph or table form.

Ch.6

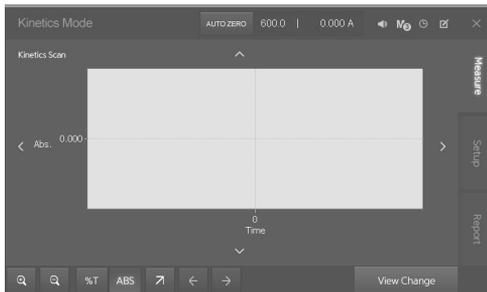


Fig. 6.13

Ch.6

9. Click ④ **View Change** to select Graph+Data, Graph, or Data.

**Note**



\* Please refer to **Section 6-1-2 Switch Screen in Ch. 6** for more detailed information on View Graph page.

Fig. 6.14 View Graph Page



Fig. 6.15 View Data Page

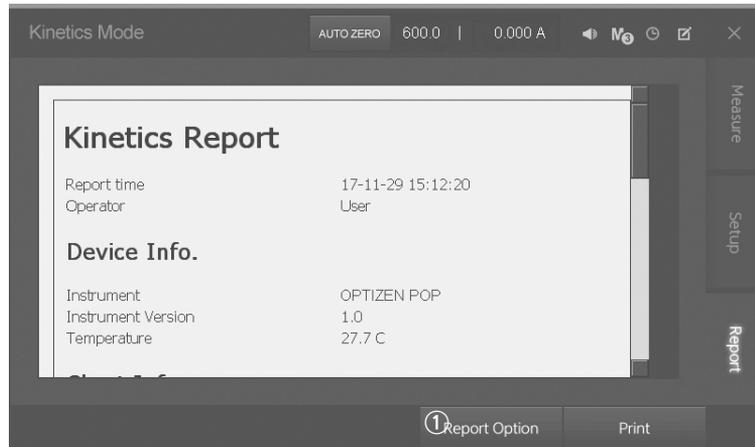


Fig. 6.16

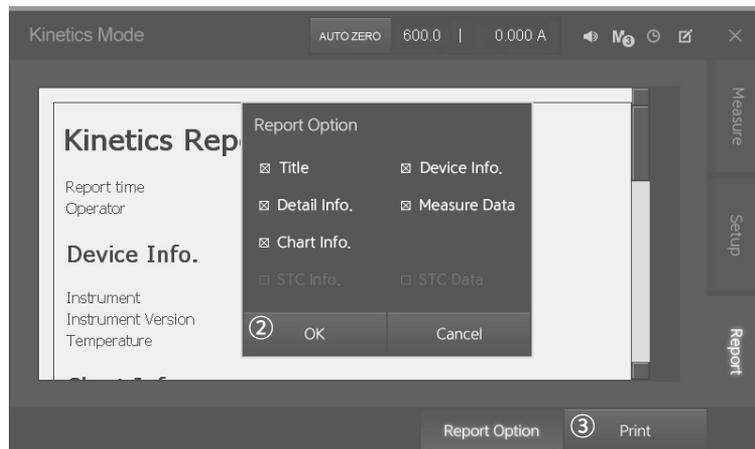


Fig. 6.17

9. Move to the <Report> tab to check or print the measured data in a report format.

10. [Figure 6] Click **1** **Report Option**, select the items to be included in the report, and click **2** **OK**

11. Check the contents to be printed and click **3** **Print** to print them.

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# **Ch. 7**

## **Equipment Setting**

7-1 Application Program Setting

7-2 Device Setting

7-3 Calibration Setting

## 7-1 Application Program Setting

This page configures the settings for the application program.



Fig. 7.1

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### List of Settings

Name	Description	Detailed Description
Int. Wavelength	Specifies the default value of the wavelength.	
Auto Zero	Selects whether the zero point will be measured.	If you select Auto Zero, the 'B' cell is automatically measured as the zero point so that there is no need for the auto zero process in MultiCell mode.
Manual Zero Point	Shows the settings of Kinetics Mode.	Specify "Manual" if you want to measure the zero point manually.
Language	Selects the language for the program.	
Shortcut	Selects the most frequently used mode.	
Host Name	Specifies the hostname.	The program connects in the specified mode without the main page when you turn on the equipment.
Administrator	Specifies the administrator name.	

## 7-2 Equipment Setting

This page configures the settings for the device.

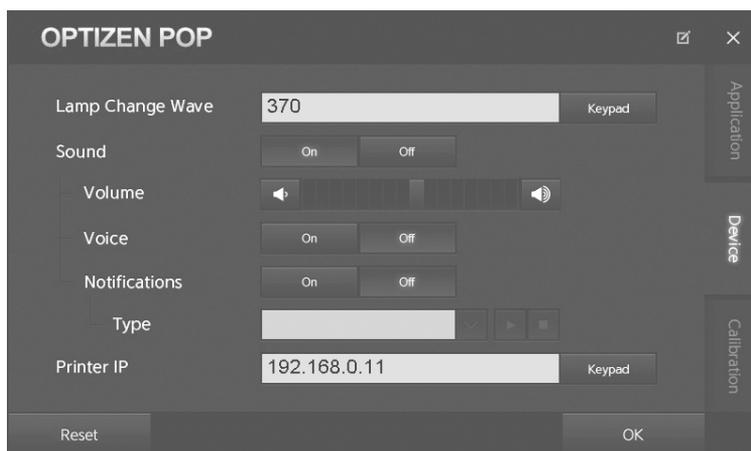


Fig. 7.2

### List of Setting

Name	Description	Detailed Description
Lamp Change Wave	Specifies the wavelength to switch between the UV lamp (D2 Lamp) and visible light lamp (W Lamp).	The accepted range is 340~410 nm.
Sound	Selects whether to use the voice support or sound effect.	
Volume	Adjusts the volume of the voice support or sound effect.	
Voice	Selects whether to use the voice guidance.	
Notifications	Selects whether to use the notice.	An alarm is activated when the lamp preheating is completed.
Type	Selects the type of notice sound.	
Printer IP	Specifies the IP address of the connected printer.	

## 7-3 Equipment Setting

This page configures the settings for the equipment calibration.

Fig. 7.3

Ch.7

### List of Settings

Name	Description
WP_A	Equipment calibration factor
WP_B	Equipment calibration factor
WP_C	Equipment calibration factor
LP_A	Equipment calibration factor
LP_B	Equipment calibration factor
LP_C	Equipment calibration factor
CP	Multicell holder calibration factor
D2	Shows the usage time of the UV lamp
W	Shows the usage time of the visible light lamp

Name	Description
WP/LP	Begins the calibration of WP and LP
CP	Begins the calibration of CP
Lamp Report	Shows the usage details of UV lamp and visible light lamp and prints them

#### Warning

Please note that an unskilled person's operation of the system can be detrimental to the equipment.

# **Ch. 8**

## **Miscellaneous**

- 8-1 Cell Type Settings
  - 8-1-1 Single Cell
  - 8-1-2 Nano Handler
  - 8-1-3 Multi Cell
  - 8-1-4 Micro Volume Cell
- 8-2 Explorer

## 8-1 Cell Type Settings

### 8-1-1 Single Cell

Click Single Cell to select this option to use Round Cell, Film Cell, or Long Path Cell.

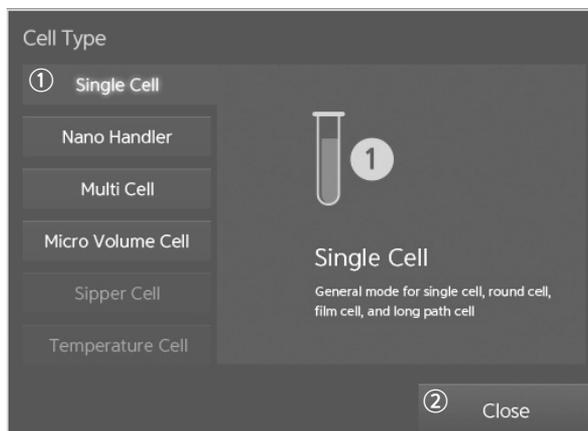


Fig. 8.1

1. Select ① <Single Cell> in Cell Type.
2. Click ② **Close** to complete the selection of Cell Type.

Ch.8

### 8-1-2 Nano Handler

Click this button to use the nano handler.



Fig. 8.2

1. Select ① <Nano Handler> in Cell Type.
2. Select a path length. (0.2 mm: 0.7- 3 ul, 1.0 mm: 3 - 5 ul)
3. Click ② **Close** to complete the selection of Cell Type.

### 8-1-3 MultiCell

MultiCell is a universal measurement mode using a rotational MultiCell holder.

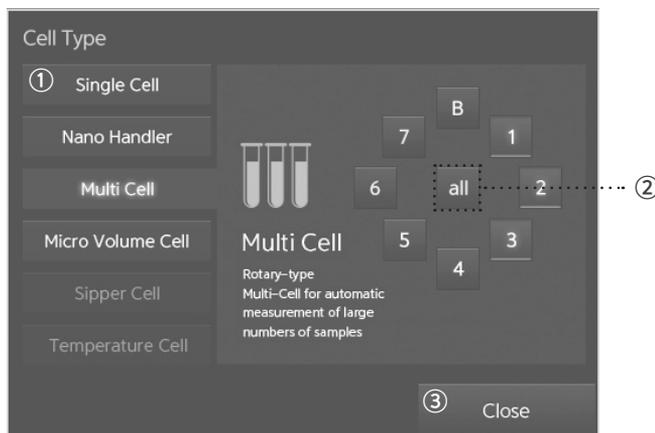


Fig. 8.3

1. Select ① <MultiCell> in Cell Type.
2. Select the cell number to measure.
3. ② all to use all eight cells.
4. Click ② Close to complete the selection of Cell Type.

Ch.8

### 8-1-4 Micro Volume Cell

Click this button to use Micro Volume Cell.

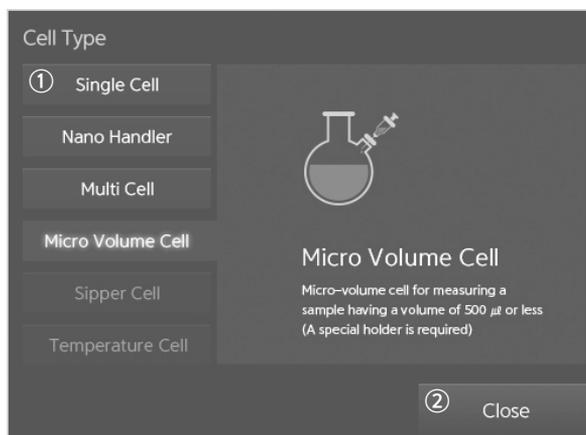


Fig. 8.4

1. Select ① <Micro Volume Cell> in Cell Type.
2. Click ② Close to complete the selection of Cell Type.

## 8-2 Explorer

The files in the equipment storage space and external storage space can be copied or deleted.

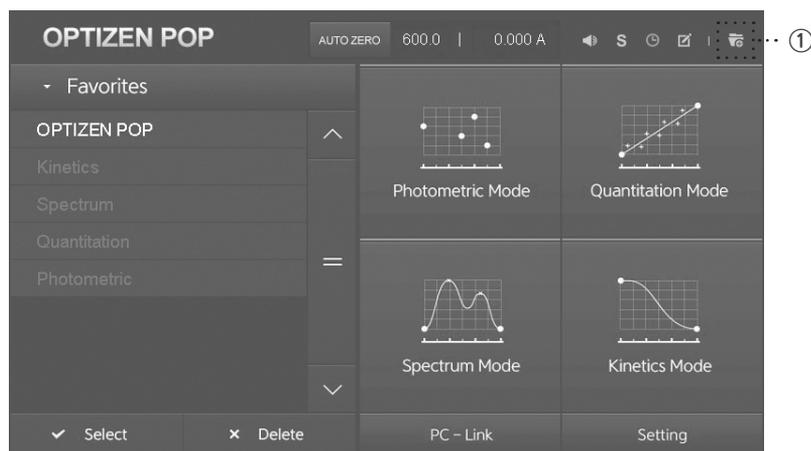
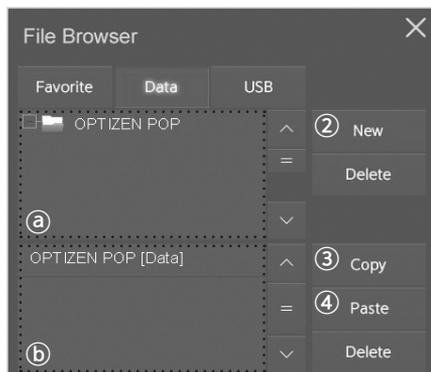


Fig. 8.4

### Ch.8



#### **i** Note

**Favorite**   **Data**   **USB**

**[Favorites]** : Storage space for Favorites. You can retrieve the file and run the job quickly and simply in the Favorites tab of the main page.

**[Data]** : Default data storage space.

**[USB]** : Default USB drive.

Fig. 8.5 (a) Displays the folder list / (b) Displays the file list of the folder.

1. Click (1) on the main page to move to the Explorer mode.
2. Select the drive from [Favorites], [Data], or [USB] to copy the file.
3. Select the (a) folder to read from the folder list.
4. Click the (b) file to select it to copy from the file list.
5. Click (3) to copy the file.
6. Select the drive from [Favorites], [Data], or [USB] to paste the file.
7. Select the (a) folder to paste the file from the folder list. (Or click (2) to create a new folder.)
5. Click (4) to paste the file.

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## Record of Revision

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Date	Revision	Changed Page	Description
12/2017	Added Page	1-1 Structure 1-2 Self-Diagnosis Function (Built-In-Test, BIT)	Page number. 16, 18
03/2018	Added Contents	Caution > Caution for Installed Area	Page number. 07
03/2018	Added Contents	Caution > Caution for Installed Area	Page number. 08
03/2018	Added Page	Caution	Page number. 09
03/2018	Added Page	Support	Page number. 10
03/2018	Added Page	1-1-1 PC Connection	Page number. 17



# K LAB (KOREA) CO.,LTD.

## Address

(34014) 94-23, Techno 2-ro, Yuseong-gu, Daejeon, Republic of Korea

## URL

[www.klabkis.com](http://www.klabkis.com)

## Phone / Fax (Technology & Services)

+82 . 42 . 932 . 7586 / +82 . 42 . 932 . 7589

## Contact

[service@klabkis.com](mailto:service@klabkis.com)