

Performance + Price + Design



UV/VIS SPECTROPHOTOMETER
OPTIZEN POP

BASIC

OPTIZEN POP, new concepts in the spectroscopy field.

Suggest you better solutions in usage of the spectrophotometer.

ABM (auto blank measuring) method

Auto blank measuring method is to measure the reference sample automatically at every measurement to minimize errors that can occur so that stability in comparable measurements can implement with double beam type spectrophotometer.

Quartz over-coating

Designed to protect high-precision optical components from contaminants. Quartz coating to parts greatly improves lifespan of the product.

8-position rotary type multi cell holder

More samples at one time measurement established the convenience and affordability to experimenters.



COMPANY PROFILE

Mecasys, a Korean company, has been a prominent and promising manufacturer in spectroscopic field since 1994. In last two decades, we have introduced our advanced technologies with timely needs to give solutions, for the fields of environmental measurement, and for the R&D and quality control fields of pharmaceuticals, food products, semiconductors, bioscience, and industries.

In modern time, we are frustrated from trying to figure out why your endotoxin level are so high even though you've just disinfected, since there are much chemicals either good or bad in your food, water, contaminated chemicals, and just alike. Becoming more responsible for needs to clean off chemicals, there are much ardor, time, and money to have better system to test, to measure, to analyze and so on. Mecasys gives you the solution to analyze the odds.

The experience gained Mecasys in both optical design analysis and computer technologies led to the production of spectrophotometric analyzer. Mecasys has committed to establish good experience in the design and development of innovative spectroscopic instrumentation for wide range of applications.



Free voltage

Stability in analyzed value with an unstable situation in a separate transformer or without power supply voltage stabilizer. It allows turning on D2 lamp unwavering to analyze in ultraviolet ray range.

Improve data accuracy: Noise elimination

Analog filter eliminates noise that occurs when sensor changes intensity through electric signal.

Multi tasking

Simultaneous motor driven is better than sequential. It allows fast tasking.

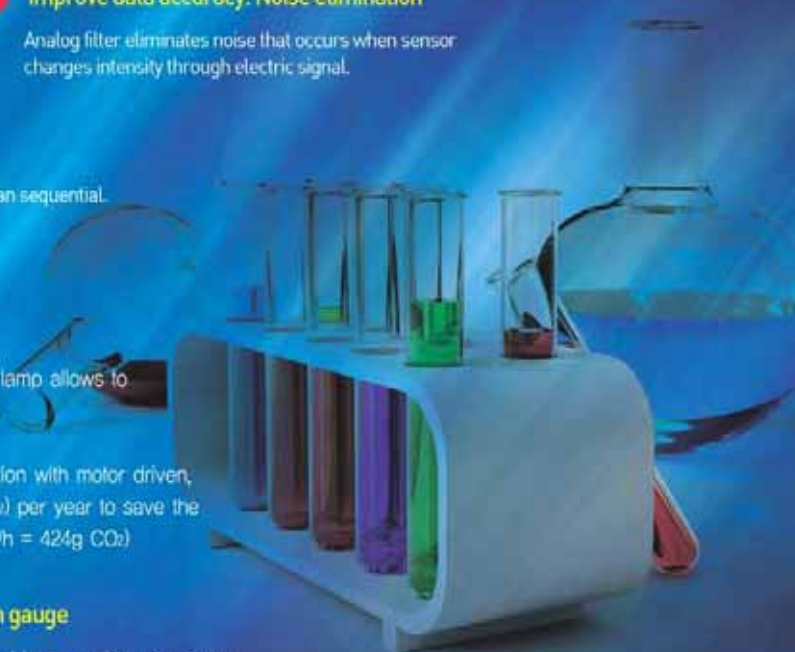
For environments and green

Selecting lamp usage such as using only tungsten lamp allows to keeping power consumption by not using D2 lamp.

OPTIZEN POP minimizes stand-by power consumption with motor driven, so that you could reduce 19kg Carbon dioxide (CO₂) per year to save the earth. (1year: 720hours usage, electricity power 1kWh = 424g CO₂)

Lamp life span gauge

Shows lifespan of lamp so that users can know when to change lamps.



BUILT IN OPERATING SOFTWARE

DNA / RNA analysis

Quantification Mode

Simple quantification method for Nucleic acids, A260(absorbance at 260nm) is used. For example, dsDNA with 1.0A of A260 value in a 10mm pathlength cell has a concentration of 50ng/ml.

The factor is varied according to types.

- dsDNA : Factor 50
- ssDNA : Factor 37
- RNA : Factor 40
- OligoDNA : factor 33

Complicated quantification methods, Warburg-Christian assay and Kalb-Behnoir assay. Ready to use formula is built-in.

Simple step: Select formula and measure.

※ Caution : Error value may occur by incorrect path length.

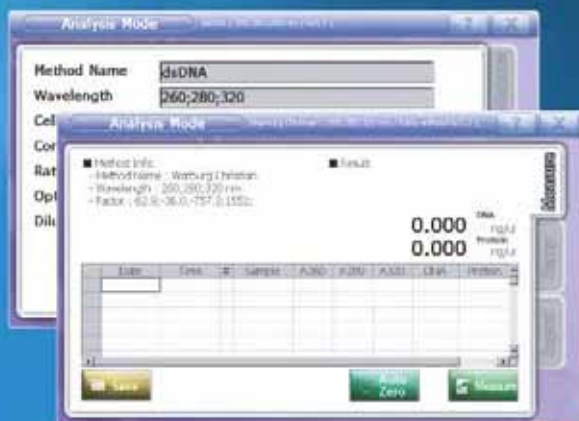


Ratio(Purity) check

Nucleic acids are exposed contaminations of impurities (TRIzol, humic acids, carbohydrates, Guanidine thiocyanate, nucleotides, peptides, EDTA, phenol and protein) during the extraction / purification or synthesis / purification. So, it is recommended to measure Ratios(A260/A280 and A260/A320) for purity estimation.

Pure DNA and RNA have expected ratios of 1.8 and 2.0 respectively. And out of this range, there might be impurities' presence in the sample.

※ Baseline correction is selected at 320nm.



Protein analysis

Direct UV [A280]

The simple quantification method determines protein quantities at 280nm. Effect of nucleic acid can be compensated by Warburg formula. [Background correction at 320nm is selectable.]

Quantification with STC

The quantification with STC method are using chromogenic materials interaction with peptides bonds, tryptophan etc.

- BCA method
- Bradford method
- Biuret method
- Lowry method



Cell Density

To check bacterial cell growth, OD600(absorbance at 600nm) is used. A linear relationship exists between cell number and absorbance at 600nm up to approximately 0.6.



ACCESSORIES

P - POP E - POP Bio Q - POP QX



1. Sipper system P Q

- Intake volume range 200 μ l - 5000 μ l
- Cuvette 10mm, 70 μ l path-length
- Power supply Free voltage
- Dimensions 173(W) x 210(D) x 130(H)
- RS 232C port connhet RS 232C port connhet



2. Temperature cell holder P B Q

- Water circulator type : temperature range -10 - 80 $^{\circ}$ C



3. Film cell holder - wide type P

- Sample limit
Thickness : 5mm
Width : 100mm, Height : 70mm



4. Film cell holder - cell type P

- Sample limit
Thickness : 2mm
Width : 10mm, Height : 30mm



5. Round cell holder (Two types) P Q

- Test tube diameter 16mm, 25mm
- Test tube height \leq 100mm



6. Long path cell holder P Q

- Rectangular optical path 50 - 100mm



7. Peltier control system P B (Temperature cell holder included)

- Temperature control range 5 - 85 $^{\circ}$ C
- Temperature accuracy \pm 0.5 $^{\circ}$ C
- Control design \pm 0.1 $^{\circ}$ C
- Power supply Free voltage



8. Micro volume cell holder P B

- \leq 1,000 μ l single cell holder
- Center height : 15mm
- Path length : 10mm



9. Nanoliter cell E

- Light path of 1mm [sample volume 3 μ l - 5 μ l]
- dsDNA range : 2ng/ μ l - 5,000ng/ μ l
- Retrieval not necessary



10. All-in-one cell holder Q

- Round cell
Tube diameter : 16 - 25mm
Tube height : 102.5mm (16mm tube)
- Square cell : 10mm



11. 8-position rotating multi-cell holder P B Q

- More sample (7cells) at one time measurement establish the convenience and affordability to experimenters. (Standard cell size : 10mm)



12. Customized cell holder

SPECIFICATIONS



UV/VIS SPECTROPHOTOMETER OPTIZEN POP SERIES

| | |
|---------------------------------|--|
| Photometric System | Single beam type |
| Spectral Bandwidth | < 1.8nm |
| Wavelength | |
| Range | 190 - 1100nm |
| Accuracy | < ± 0.5nm (at D2 Peak 656.1nm, 486.0nm) |
| Reproducibility | < ± 0.1nm |
| Setting | ≥ 0.1nm |
| Slew Rate | about 7,800nm/min |
| Scanning Speed | Max 4,000nm/min |
| Photometric | |
| Range | - 3.0 - 3.0ABS(Enable to set up) / - 0.5 - 2.5ABS(with Nanoliter cell) |
| Accuracy | ± 0.005 ABS (at 1.0ABS) |
| Reproducibility | ± 0.003 ABS (at 1.0ABS) |
| Stray light | < 0.05 %T (220nm, 340nm) |
| Baseline Stability | ± 0.001 ABS/h (at 550 nm) |
| Baseline Flatness | ± 0.002 ABS (200 - 1100nm) |
| Light source | Tungsten-halogen lamp and Deuterium lamp |
| Lamp Change Wavelength | 340 - 410nm (Default 370nm), including Auto Position System |
| Monochromator | Modified Czerny-Turner type with 1200lines/mm blazed grating |
| Standard Cell Holder | |
| OPTIZEN POP | Rotary type 8 position multi cell holder |
| OPTIZEN QX | All-in-one cell holder |
| OPTIZEN BIO | Micro volume cell holder |
| Interface | 4 USB ports / 3 RS-232C ports |
| Data Capacity | 2 GB (OPTION : 8 GB) |
| Interacting Printer type | Network printer, USB port Type printer (Support PCL mode) |
| Detector | Silicone Photodiode |
| Power Requirement | Free Voltage |
| Dimension | 433[W]mm x 381[D]mm x 180[H]mm |
| Weight | 8Kg |

OPTIZEN POP BIO

User's Guide

May 2011 (2st edition)
Mecasys Co., Ltd.

Notice!

Spectrophotometer Optizen® and Software OptizenView™ are trademarks of Mecasys Co., Ltd.

No part of the Optizen Series, including this publication may be reproduced, or modified in any form or by any means without the prior written permission of Mecasys Co., Ltd.

For more detail information on Optizen® and OptizenView™, you may refer to “Technical Support” in the last Chapter of this guide or visit our websites below.

<http://english.mecasys.co.kr>

Contents

Part I . Introduction & General Information

| | |
|--------------------------------|----|
| 1. Introduction | 6 |
| 2. Specifications | 7 |
| 3. Constructions | 8 |
| 1) External Construction | 8 |
| 2) Cell Holder | 10 |
| 4. Turning on Switch | 11 |

Part II . OPTIZEN POP BIO

| | |
|--|----|
| 1. Nucleic Acid | 14 |
| 1) Measurement | 14 |
| 2) Setup | 16 |
| 3) Report | 17 |
| 4) Nucleic Acid Guideline | 18 |
| 2. Warburg-Christian | 22 |
| 1) Measurement | 22 |
| 2) Setup | 24 |
| 3) Report | 25 |
| 4) Warburg-Christian Guideline | 26 |
| 3. Kalb-Bernlohr | 30 |
| 1) Measurement | 30 |
| 2) Setup | 32 |
| 3) Report | 33 |
| 4) Kalb-Bernlohr Guideline | 34 |
| 4. Protein Analysis | 38 |
| 4-1. Standard Curve mode | 38 |
| 1) How to open standard curve mode | 38 |

| | |
|--|----|
| 2) Measurement | 39 |
| 3) Setup | 40 |
| 4) Report | 42 |
| 4-2. Analyzing mode | 43 |
| 1) Measurement | 43 |
| 2) Setup | 44 |
| 3) Report | 45 |
| 4-3. Protein Analysis Guideline | 46 |
| 5. Cell density | 53 |
| 1) Measurement | 53 |
| 2) Setup | 55 |
| 3) Report | 56 |
| 4) Cell density Guideline | 57 |
| 6. Customize | 61 |
| 1) Measurement | 61 |
| 2) Setup | 62 |
| 3) Report | 64 |
| 4) Cell density Guideline | 66 |
| 7. ABS/%T/Conc. | 70 |
| 7-1. Standard Curve mode | 70 |
| 1) How to open standard curve mode | 70 |
| 2) Measurement | 71 |
| 3) Setup | 73 |
| 4) Report | 76 |
| 7-2. Analyzing mode | 77 |
| 1) Measurement | 77 |
| 2) Setup | 79 |
| 3) Report | 81 |

| | |
|--|-----|
| 7-3. Import/Export | 82 |
| 1) Import | 82 |
| 2) Export | 83 |
| 7-4. ABS / %T / Conc. mode Guideline | 84 |
| 8. Survey Scan | 92 |
| 1) Measurement | 92 |
| 2) Setup | 95 |
| 3) Report | 96 |
| 4) Survey Scan mode Guideline | 97 |
| 9. Kinetic | 101 |
| 1) Measurement | 101 |
| 2) Setup | 104 |
| 3) Report | 105 |
| 4) Kinetic mode Guideline | 106 |
| 10. Cell type..... | 110 |
| 11. File browser | 119 |
| 12. File open | 120 |
| 13. PC link | 121 |
| 14. POP Set | 123 |
| 1) Application set..... | 123 |
| 2) Device set | 124 |
| 3) Calibration | 125 |

Part III. Technical Supports

| | |
|-----------------------------|-----|
| 1. Technical Supports | 126 |
|-----------------------------|-----|

Part I . Introduction & General Information

1. Introduction

Thank you for purchasing nanobiometer, Optizen POP bio!

Optizen POP Bio is designed for bio applications such as Nucleic acids analysis, protein analysis and cell density with easy-to-use bio software.

Convenient interface and auto-functions of OPTIZEN POP bio lead your test to be easier, faster, and more accurate.

OPTIZEN POP bio provides you rich visual contents with 7 inch color LCD and easy operating with touch screen function. And Windows CE system, which is powerful and stable, enables 2GB of standard memory, USB data backup, user friendly interface, network operation and so on.

OPTIZEN POP bio also provides you on-line diagnosis and upgrade via network connection.

Usage of the manual

This manual includes the instructions of system installation, operation, experiment setting, data editing and so on.

Mecasys Co., Ltd. will continuously support update via mail, internet or e-mail.

2. Specifications

| | |
|-------------------------------|--|
| Photometrics System | Single Beam Type |
| Spectral Bandwidth | <1.8nm |
| Wavelength | |
| Range | 190~1100nm |
| Accuracy | <± 0.5nm (at D2 Peak 656.1nm, 486.0nm) |
| Reproducibility | <± 0.1nm |
| Setting | ≤ 0.1nm |
| Slew Rate | About 7,800nm/min |
| Scanning Speed | Max 4,000nm/min |
| Photometric | |
| Range | -3.0 ~ 3.0 ABS (Enable to Set Up) |
| Accuracy | ± 0.005 ABS (at 1.0 ABS) |
| Reproducibility | ± 0.003 ABS (at 1.0 ABS) |
| Stray Light | < 0.05%T (220nm, 340nm) |
| Baseline Stability | <± 0.001ABS/h (at 550nm) |
| Baseline Flatness | <± 0.002 ABS (200 ~ 1100nm) |
| Light Source | Tungsten-Halogen & Deuterium Lamp |
| Lamp Change Wavelength | 340~410nm (Default 370nm), including Auto Position System |
| Monochromator | Modified Czerny-Turner type with 1200lines/mm blazed Grating |
| Standard Cell Holder | Rotary type 8 position Multi Cell Holder |
| Interface | 4 USB ports / 3 RS-232C ports |
| Data Capacity | 2 Giga byte (8 Giga byte – Optional) |
| Detector | Silicone Photodiode |
| Power Requirement | Free Voltage |
| Dimensions | 433(W) × 381(D) × 180(H)mm |
| Weight | 8kg |

3. Constructions

1) External Construction



- ① Optional Acrylic Plate
- ② 7 Inch LCD (Touch Screen)

Main



- ① 4 USB PORT

Right Side



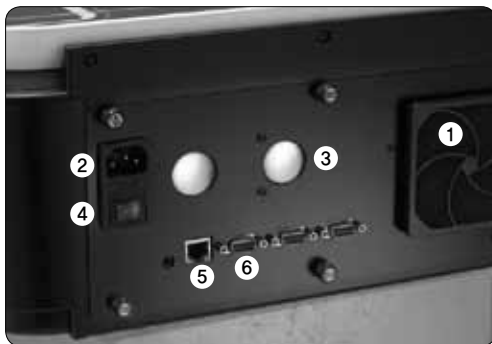
- ① One-Touch Type Sample Compartment Cover
- ② 8-position Rotary Type Multi cell Holder

Left Side



① Remove Type Front Cover

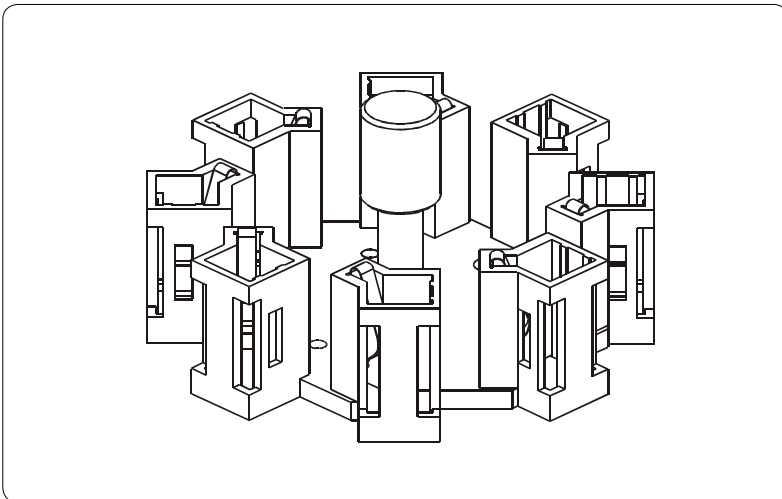
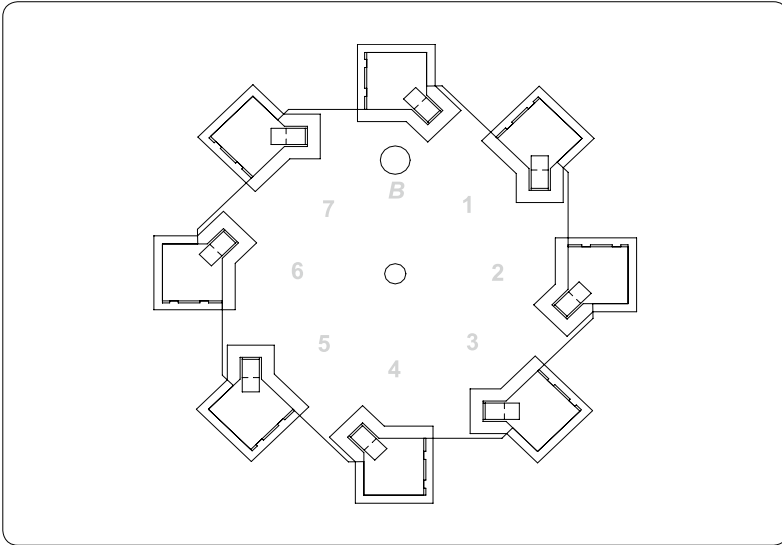
Front Cover



- ① Fan
- ② Power connection
- ③ Speaker
- ④ Main Power
- ⑤ Ethernet
- ⑥ Port for Accessory

Rear Plate

2) Cell Holder



4. Turning on Switch



| Optizen Mecasys | Initial Calibration |
|-----------------|---------------------|
| CPU_ROM | Complete |
| WAVE MOTOR | Complete |
| CELL MOTOR | Complete |
| FILTER MOTOR | Complete |
| W LAMP | Good |
| D2 LAMP | Good |
| D2 Wave | Complete |

It is self-tuning about CPU & ROM, Wavelength, Cell, Filter, D2 Lamp, and W Lamp. Results of self-tuning indicate Complete or Error. In case Error occurs at any step, self-tuning is stopped. If you want to check next step, push [ENTER] button. Only everything is Complete, automatically move to Main Mode.

To get more stable data,

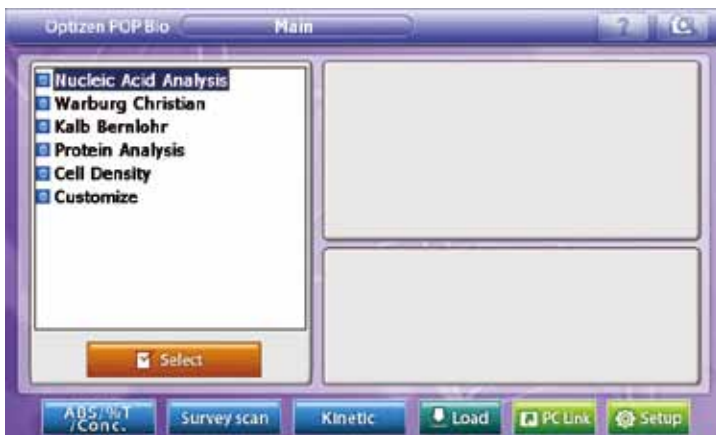
please warm up the system about 30 minutes after turning on the switch.

- **CPU_ROM** : Check CPU & ROM
- **WAVE MOTER** : Wavelength motor driving test
- **CELL MOTER** : Multi-Cell Holder driving test
- **FILTER MOTER** : Filter driving test
- **W LAMP** : Check the status of Tungsten-halogen Lamp
- **D2 LAMP** : Check the status of Deuterium Lamp
- **D2 WAVE** : Check the status of Deuterium Lamp Wave

Part II . OPTIZEN POP BIO

Optizen POP Bio provides Nucleic acid analysis, Protein analysis and cell density with easy-to-use bio software. It is consisted as Nucleic Acid, Warburg-Christian, Kalb-Bernlohr, Protein Analysis and Cell Density mode.

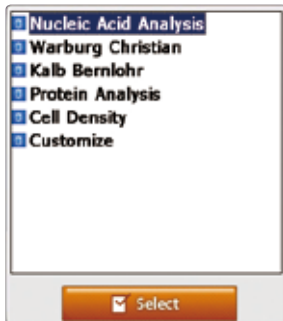
And customize mode for multiple wavelength analysis.



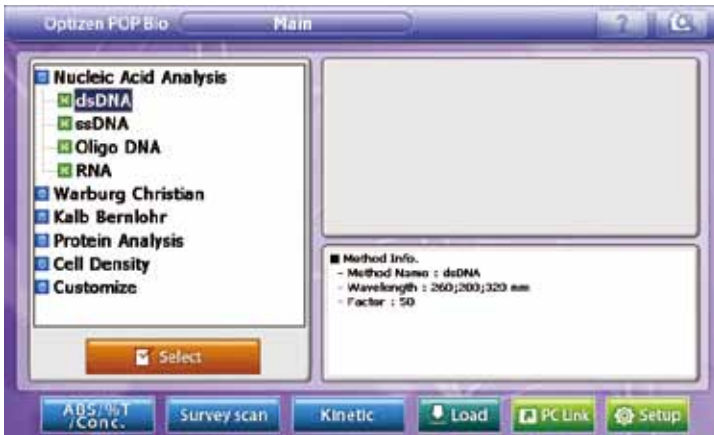
- **Nucleic Acid** : dsDNA, ssDNA, OligoDNA, RNA quantification/purify check
- **Warburg** : Christian - Warburg-Christian
- **Kalb-Bernlohr** : Kalb-Bernlohr
- **Protein Analysis** : Bradford, Lowry, BCA, Biuret, Direct UV
- **Cell Density** : Cell Density
- **Customize** : Custom Mode


Mode selection

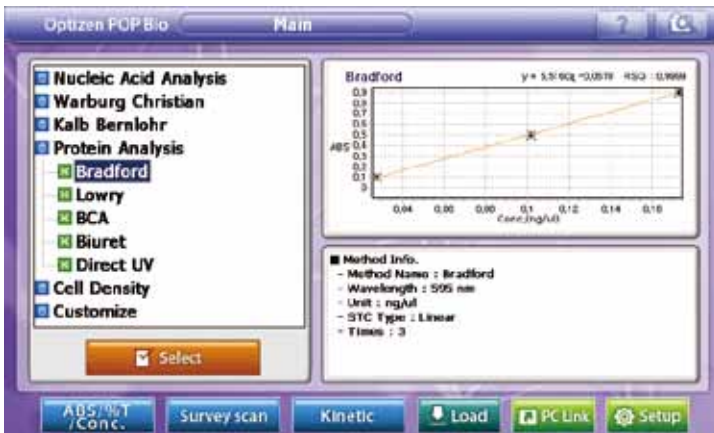
1. As double-clicking the desired folder, Sub list will appear.



2. Touch the desired item/mode. Method Info. Will show up at the right window.



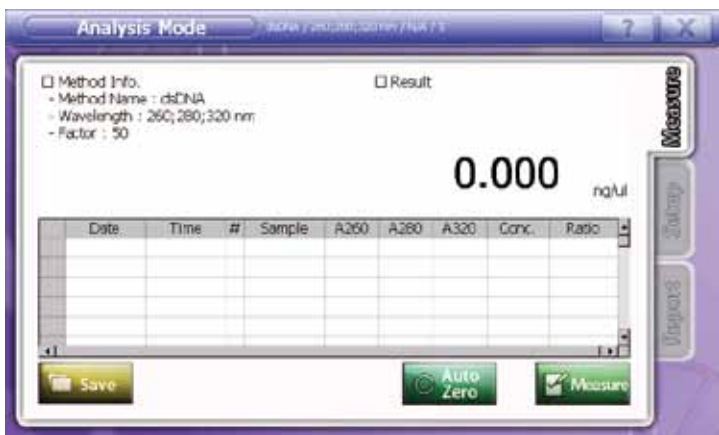
3. After checking Method Info., touch  to proceed to measure mode. If you select Protein Analysis, you can also check the last-saved standard curve. (Except for Direct UV)



1. Nucleic Acid



This mode is to measure the concentration and ratio of dsDNA, ssDNA, OligoDNA, RNA at the pre-set wavelengths. Results show up at data table and result tap at the right upper side of the window.


1) Measurement

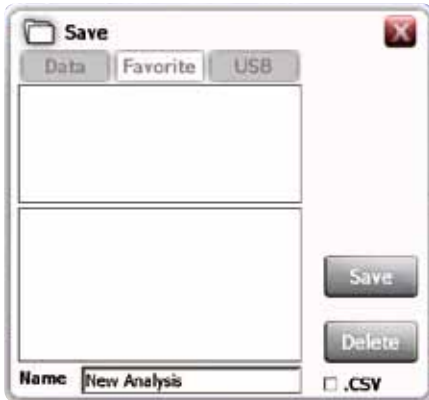







- **Input sample name** – Double click desired window, and keypad appears.
Input sample name.

- **Measurement**

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

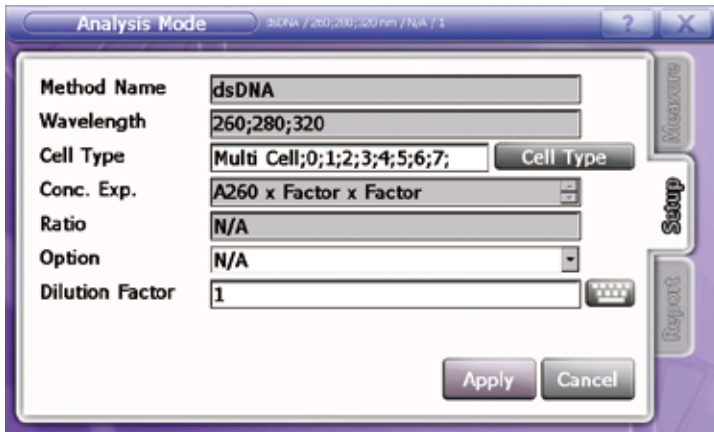
- **Save** - To save measured data, touch  .



1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.

2) Setup

Setting factors to be applied for measurement. Set up cell type, Ratio method and factor. Method name, wavelength, Conc., and Exp. are not amendable. Ratio is automatically set by selecting ratio method.



- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)



- **Ratio Method selection**

N/A : Do not use Ratio Method.

Ratio without B.C. : Calculate the ratio without background correction using A320 value.


$$\text{Ratio} = A260 / A280 \text{ (dsDNA, ssDNA, OligoDNA)}$$

$$\text{Ratio} = A260 / A230 \text{ (RNA)}$$

Ratio with B.C. : Calculate the ratio with background correction using A320 value.

$$\text{Ratio} = (A260 - A320) / (A280 - A320) \text{ (dsDNA, ssDNA, OligoDNA)}$$


$$\text{Ratio} = (A260 - A320) / (A230 - A320) \text{ (RNA)}$$

- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result.
Touch  to input the dilution factor.

3) Report

Preview allows displaying measured data, then print out. Device info, Method info, Analyze Info and Analyze data will show up.



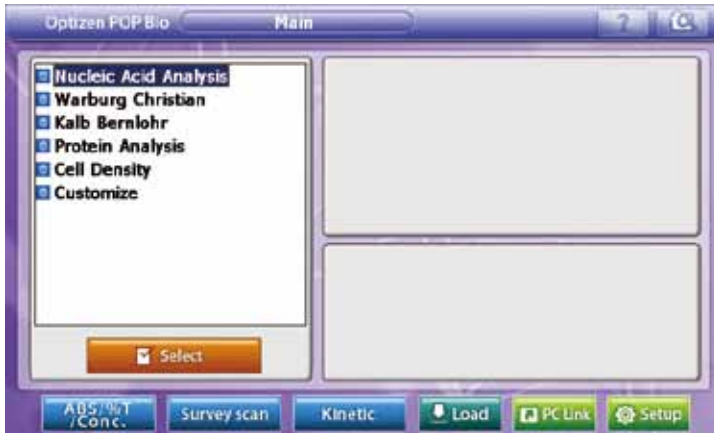
And touch  to select items to print out.



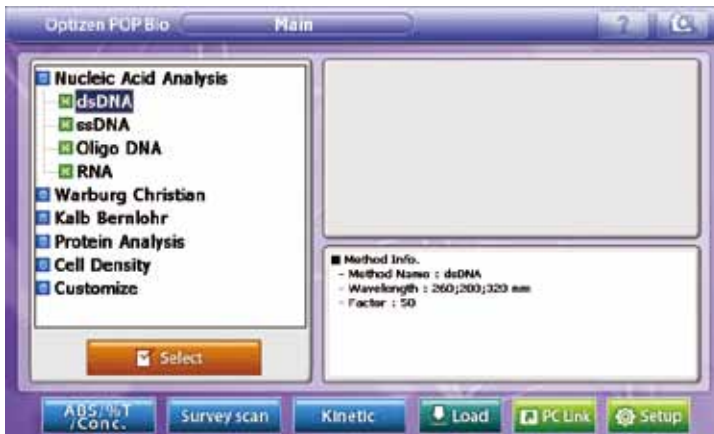
Touch  to print out after reviewing.

4) Nucleic Acid Guideline

1. As double clicking [Nucleic Acid Analysis] at the main menu, the sub list of [Nucleic Acid Analysis] will show up. Check method list.

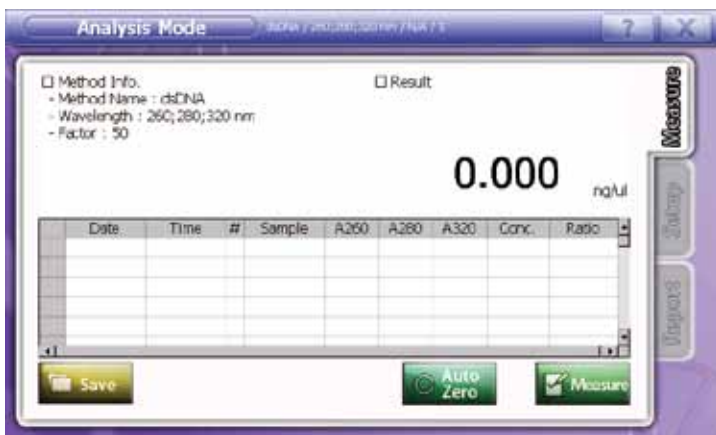


2. Click the desired method once at the sub list of [Nucleic Acid Analysis].

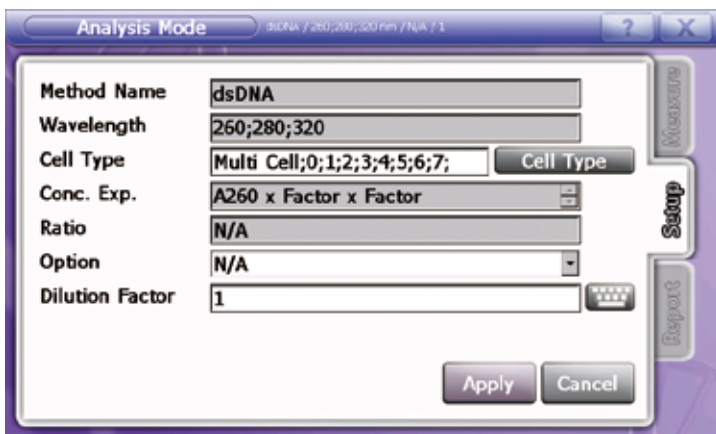


Detail method info. will show up on the right bottom window.


3. After checking Method Info., touch  to proceed to analyzing mode.




4. Touch [Setup] to set the measuring conditions.




Modify cell type, ratio method and factor as the experiment conditions. Method name, wavelength and Conc. Exp. are not amendable, and ratio is automatically set by selecting ratio method.


5. Touch  to apply setting. [Measurement] screen will show up.




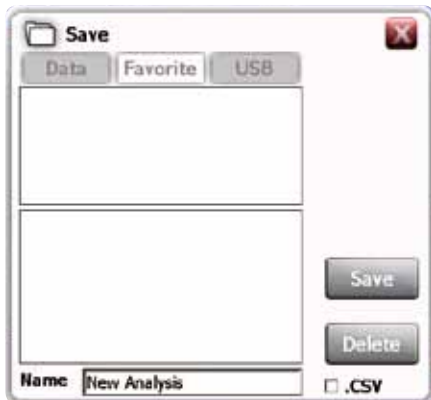
6. Input the blank(reference) sample to cell holder and touch  to make Auto zero.

7. After making auto zero, input the sample to cell holder and touch  to measure.

8. Repeat item 7. For more samples. Results show up at data table and result tap at the right upper side of the window.

9. To save measured data, touch .



10. Select the storage device and folder. Then input file name and touch  to save.




Check at .CSV to save as excel form.

11. Move to [Report] tap to review measured data or print out.



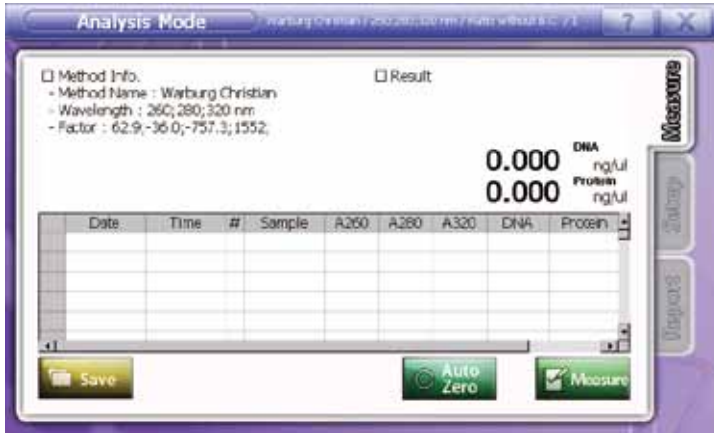
12. Touch  to select items to print out. And touch  to apply. Selected items are applied.

13. Touch  to print out after reviewing.

2. Warburg-Christian



This mode is to measure the concentration of DNA and Protein with Warburg-Christian Method. Results show up at data table and result tap at the right upper side of the window.


1) Measurement

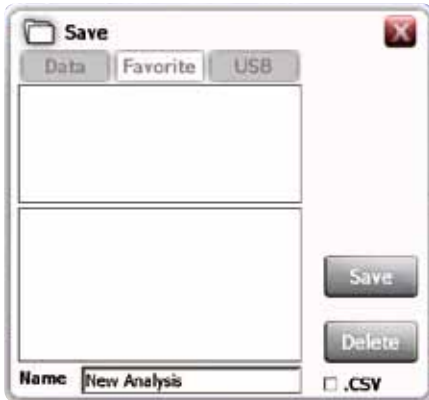







- **Input sample name** – Double click desired window, and keypad appears.
Input sample name.

- **Measurement**

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

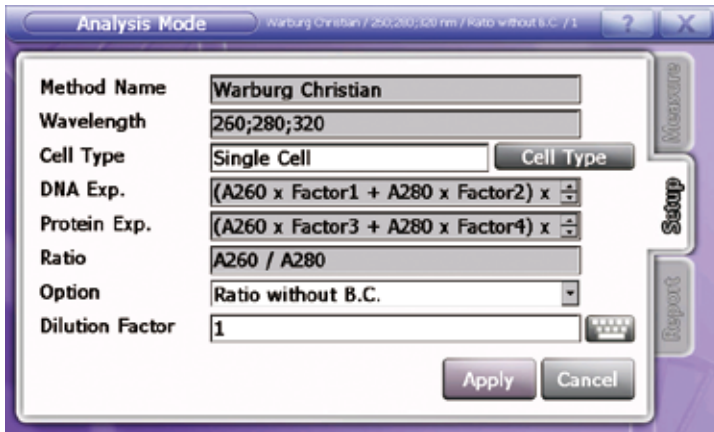
- **Save** - To save measured data, touch  .



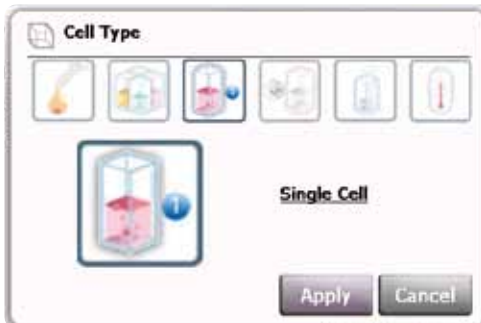
1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.

2) Setup

Setting factors to be applied for measurement. Set up cell type, Ratio method and factor. Method name, wavelength, Conc., and Exp. are not amendable. Ratio is automatically set by selecting ratio method.



- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)




• Ratio Method selection

Ratio without B.C. : Calculate the ratio without background correction using A320 value.

$$\text{Ratio} = A260 / A280$$

Ratio with B.C. : Calculate the ratio with background correction using A320 value.


$$\text{Ratio} = (A260 - A320) / (A280 - A320)$$

- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result. Touch  to input the dilution factor


3) Report

Preview allows displaying measured data, then print out. Device info, Method info, Analyze Info and Analyze data will show up.



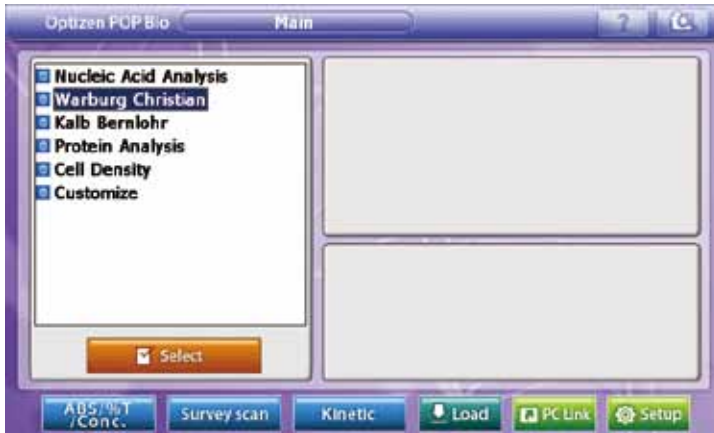
And touch  to select items to print out.



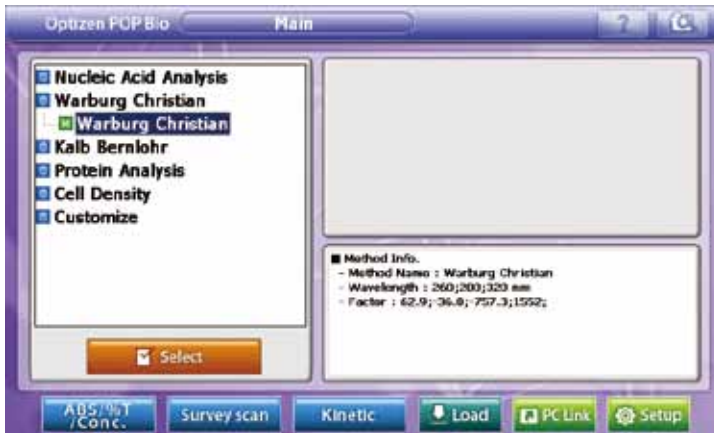
Touch  to print out after reviewing.

4) Warburg-Christian Guideline

1. As double clicking [Warburg-Christian] at the main menu, the sub list of [Warburg-Christian] will show up. Check method list.

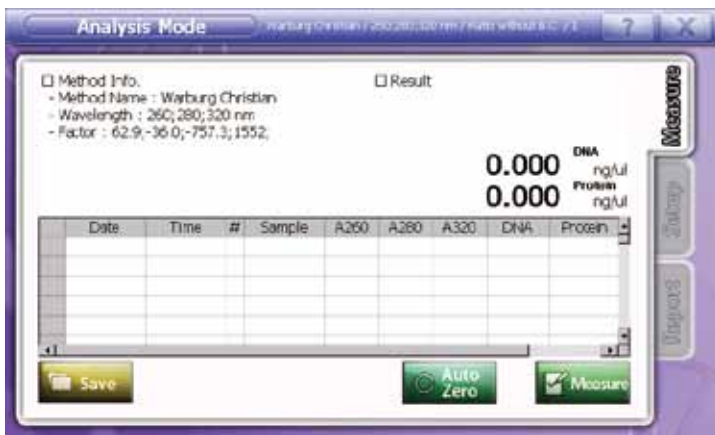


2. Click the desired method once at the sub list of [Warburg-Christian].

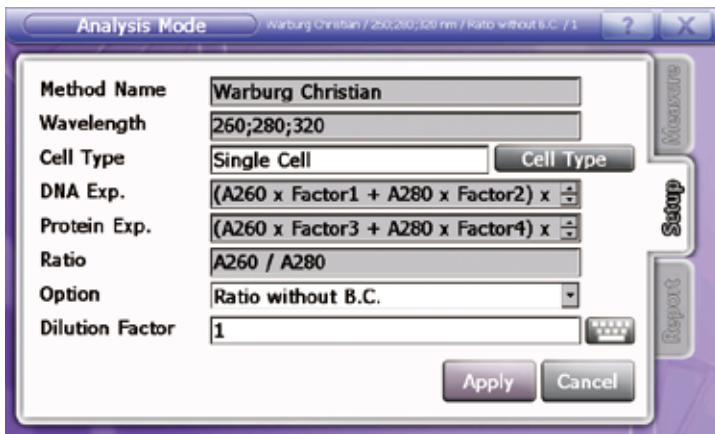


Detail method info. will show up on the right bottom window.

3. After checking Method Info., touch  to proceed to analyzing mode.

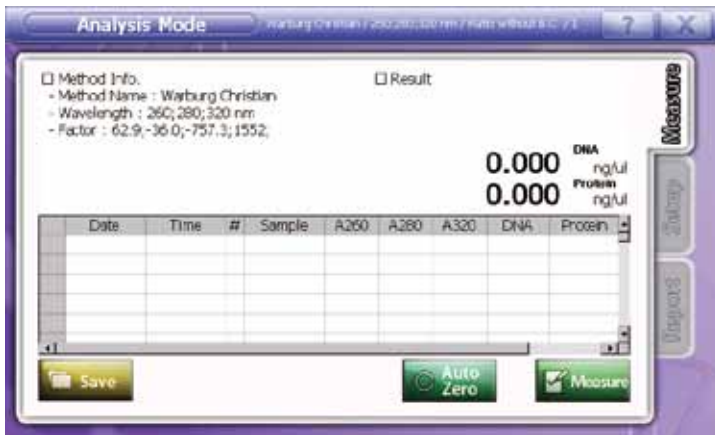



4. Touch [Setup] to set the measuring conditions.




Modify cell type, ratio method and factor as the experiment conditions. Method name, wavelength and Conc. Exp. are not amendable, and ratio is automatically set by selecting ratio method.


5. Touch **Apply** to apply setting. [Measurement] screen will show up.




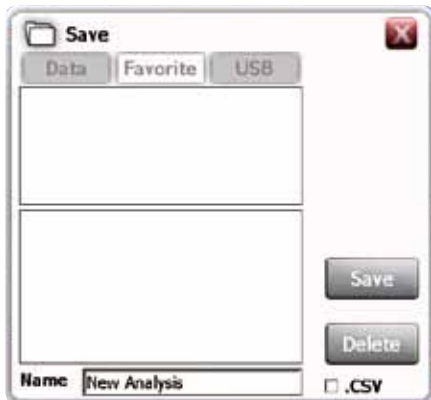
6. Input the blank(reference) sample to cell holder and touch  to make Auto zero.

7. After making auto zero, input the sample to cell holder and touch  to measure.

8. Repeat item 7. For more samples. Results show up at data table and result tap at the right upper side of the window.

9. To save measured data, touch .



10. Select the storage device and folder. Then input file name and touch  to save.




Check at .CSV to save as excel form.

11. Move to [Report] tap to review measured data or print out.



12. Touch  to select items to print out. And touch  to apply. Selected items are applied.

13. Touch  to print out after reviewing.

3. Kalb-Bernlohr



This mode is to measure the concentration of DNA and Protein with Kalb-Bernlohr Method. Results show up at data table and result tap at the right upper side of the window.


1) Measurement

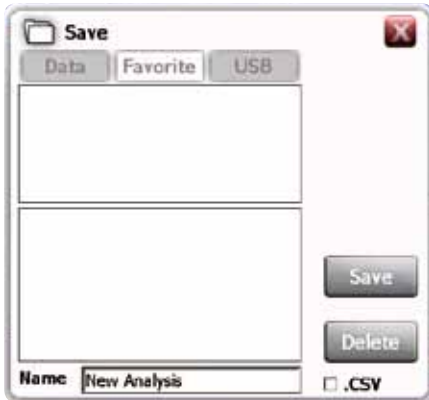







- **Input sample name** – Double click desired window, and keypad appears. Input sample name.

- **Measurement**

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

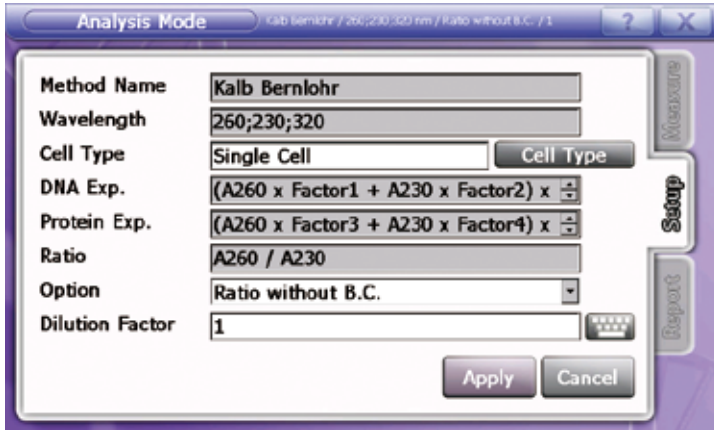
- **Save** - To save measured data, touch  .



1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.

2) Setup

Setting factors to be applied for measurement. Set up cell type, Ratio method and factor. Method name, wavelength, Conc., DNA Exp., and Protein Exp. are not amendable. Ratio is automatically set by selecting ratio method.



- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)




• Ratio Method selection

Ratio without B.C. : Calculate the ratio without background correction using A320 value.

$$\text{Ratio} = A260 / A280$$

Ratio with B.C. : Calculate the ratio with background correction using A320 value.


$$\text{Ratio} = (A260 - A320) / (A280 - A320)$$

- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result. Touch  to input the dilution factor.


3) Report

Preview allows displaying measured data, then print out. Device info, Method info, Analyze Info and Analyze data will show up.



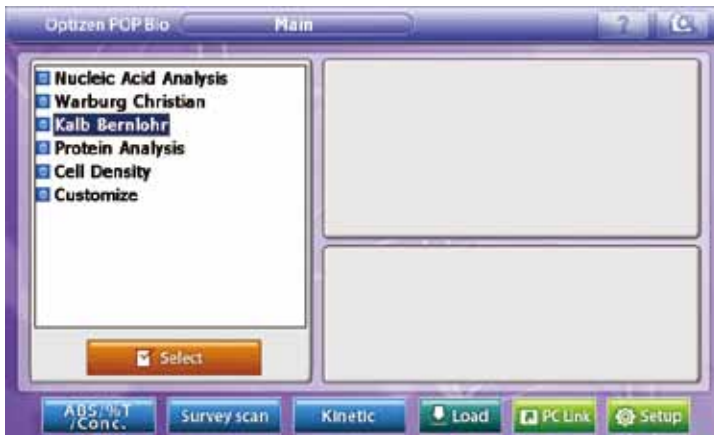
And touch  to select items to print out.



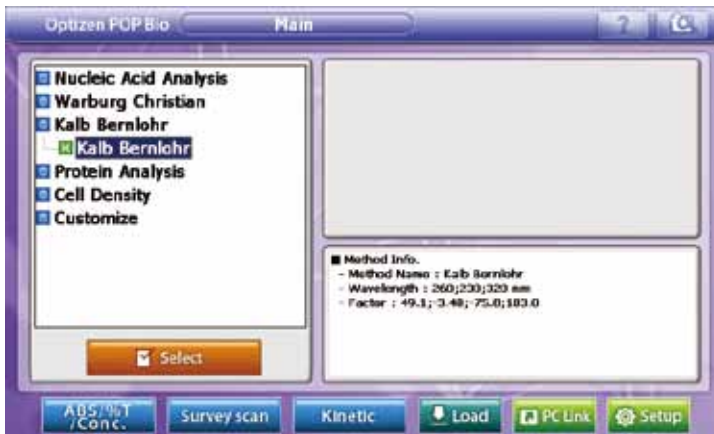
Touch  to print out after reviewing.

4) Kalb-Bernlohr Guideline

1. As double clicking [Kalb-Bernlohr] at the main menu, the sub list of [Kalb-Bernlohr] will show up. Check method list.



2. Click the desired method once at the sub list of [Kalb-Bernlohr].

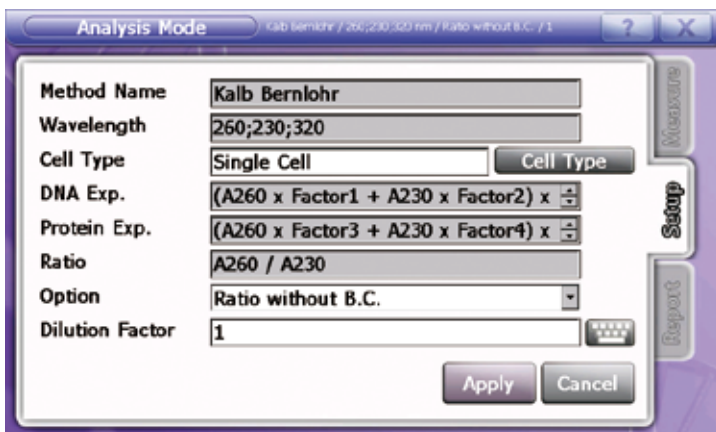


Detail method info. will show up on the right bottom window.

3. After checking Method Info., touch  to proceed to analyzing mode.







4. Touch [Setup] to set the measuring conditions.

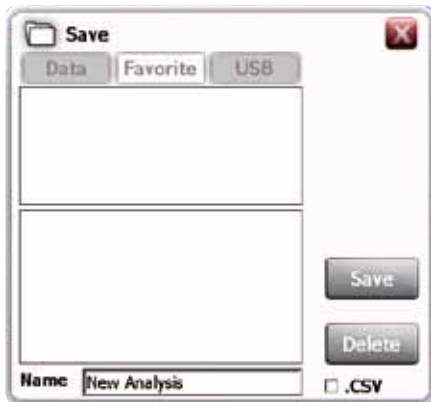


Modify cell type, ratio method and factor as the experiment conditions. Method name, wavelength, DNA Exp. and Protein Exp. are not amendable, and ratio is automatically set by selecting ratio method.

5. Touch **Apply** to apply setting. [Measurement] screen will show up.

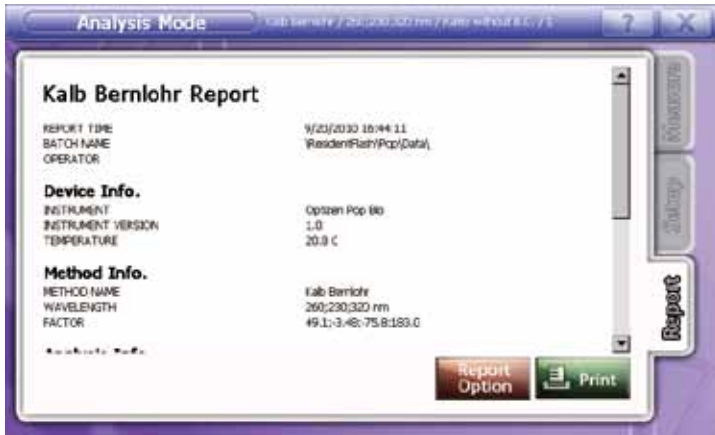




6. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
7. After making auto zero, input the sample to cell holder and touch  to measure.
8. Repeat item 7. For more samples. Results show up at data table and result tap at the right upper side of the window.
9. To save measured data, touch .
10. Select the storage device and folder. Then input file name and touch  to save.




Check at **.CSV** to save as excel form.

11. Move to [Report] tap to review measured data or print out.



12. Touch  to select items to print out. And touch  to apply. Selected items are applied.

13. Touch  to print out after reviewing.

4. Protein Analysis

This mode is to measure the concentration of protein with Bradford, Lowry, BCA, Biuret, and Direct UV Method. The standard curve is needed to analysis with Bradford, Lowry, BCA, Biuret Method. Use standard curve mode to draw it.

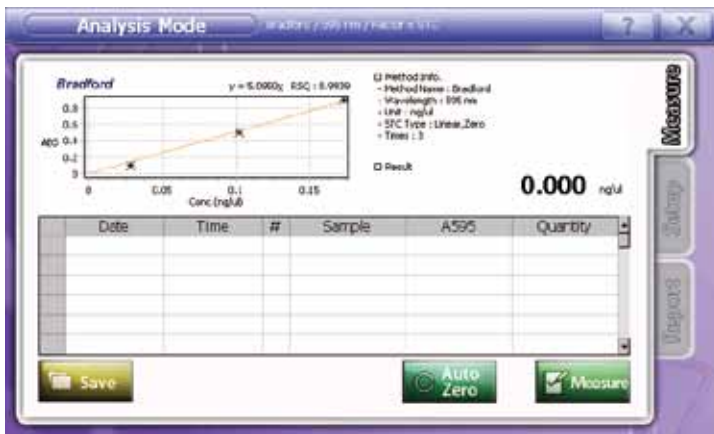
(Refer to **Nucleic Acid Method** for the usage of Direct UV Method)

Results show up at data table and result tap at the right upper side of the window.

4-1. Standard Curve mode

1) How to open standard curve mode

Double click the standard curve graph at the left upper side of window to proceed to standard curve mode.



At Standard Curve mode, recently saved standard curve is stored.






2) Measurement

Input concentration values of standard samples to Conc. orderly, and draw standard curve with measuring standard samples.





- **Input sample name** – Double click the desired window below [Conc.], then keypad appears. Input concentrations.

• Measurement

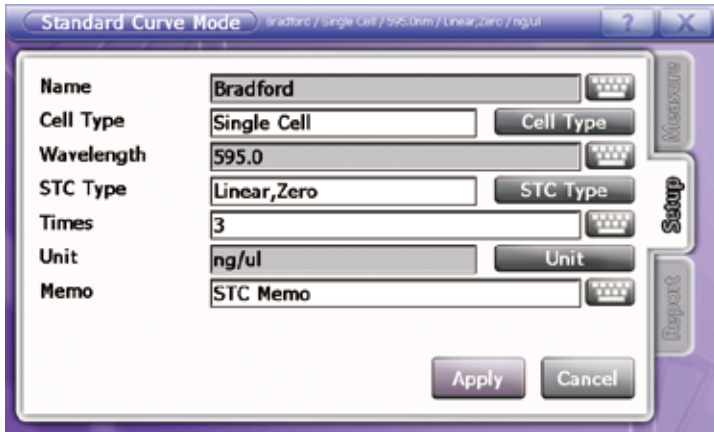
1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the first standard sample to cell holder and touch  to measure.
3. Repeat item 2. For more standard samples.
(Max 7 samples can be measured at one time with multi cell holder.)
4. After measuring, OPTIZEN POP BIO will draw the standard curve with measured data automatically, and it will also tell you the equation and RSQ value of the standard curve.
5. Each row, there is a mark box to select data. Check a mark box to select data or undo to exclude data and touch .

• Save

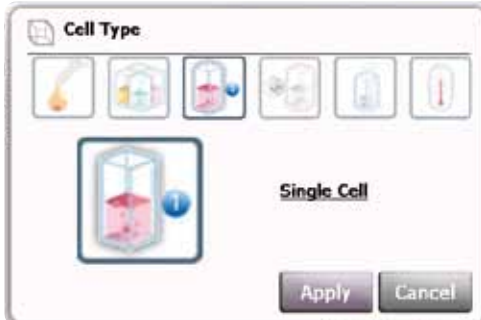
1. Touch  to save the created standard curve.
2. Message will appear after saving.
3. Touch  to proceed to protein analysis mode.

2) Setup

Set factors and functions. Set up Cell type, STC type, measuring times and memo. Name, wavelength and unit are not amendable.





- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)



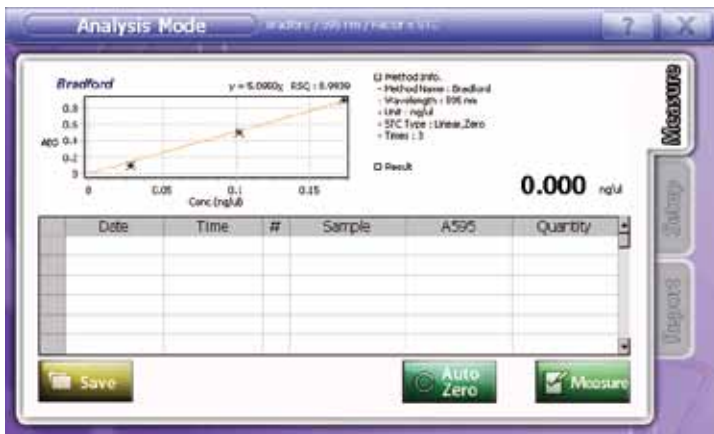
- **STC type** - Touch **STC Type** and STC type list will show up. Select the proper one among linear (0), linear, quadratic and cubic.



- **Times** - Input the number of measurement for each cell. Touch  and input measuring times, Max. 5.
- **Memo** - Touch  to write brief information on measurement.



4-2. Analyzing mode

1) Measurement

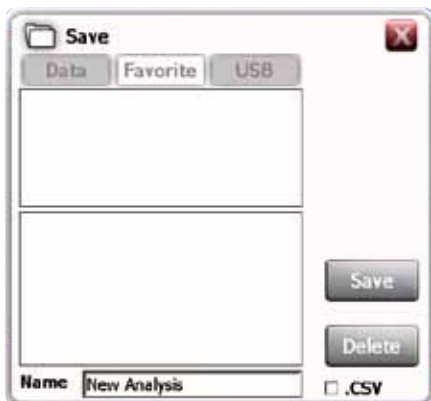


- **Input sample name** – Double click desired window, and keypad appears. Input sample name.

• Measurement

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

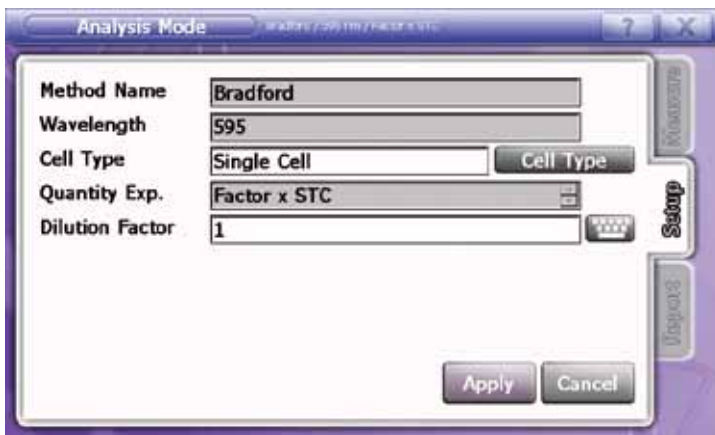
- **Save** - To save measured data, touch  .



1. Select the storage device from .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch to store.
6. Touch to eliminate the file.


2) Setup

Setting factors to be applied for measurement. Set up cell type and factor. Method name, wavelength and Quantity Exp. are not amendable.



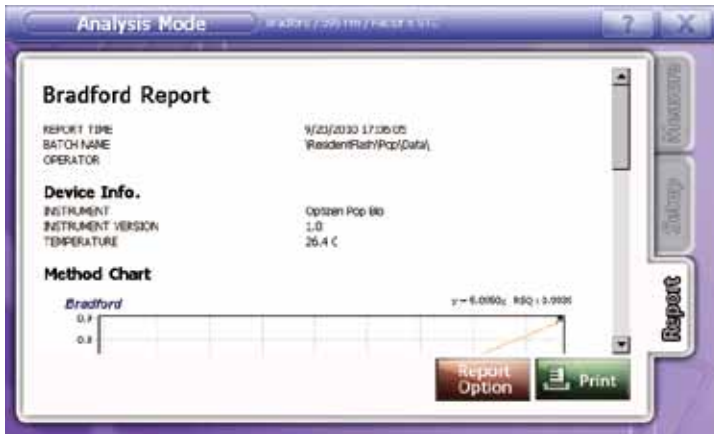
- **Cell type** - Touch to find proper one and touch to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)




- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result.
Touch  to input the dilution factor.


3) Report

Preview allows displaying measured data, then print out. Device info, Method Chart, Method Info., Analyze Info. and Analyze data will show up.



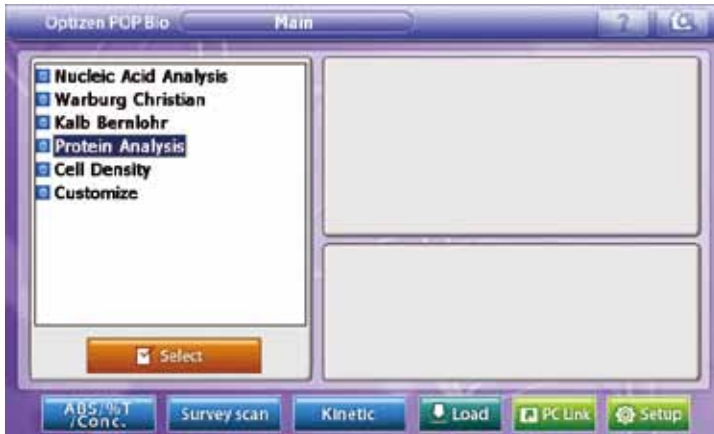
And touch  to select items to print out.



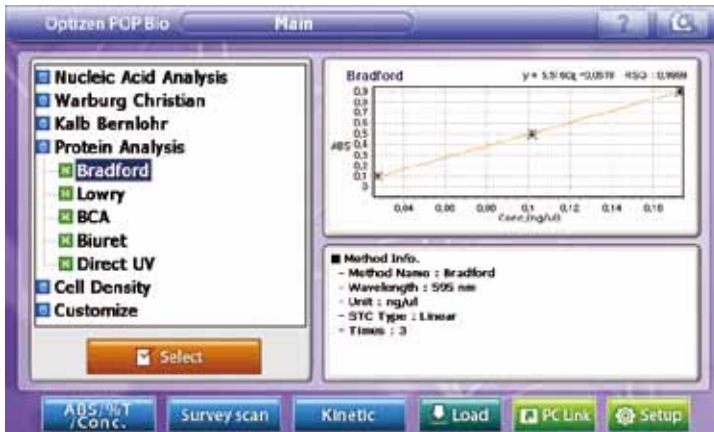
Touch  to print out after reviewing.

4-3. Protein Analysis Guideline

1. As double clicking [Protein Analysis] at the main menu, the sub list of [Protein Analysis] will show up. Check method list.

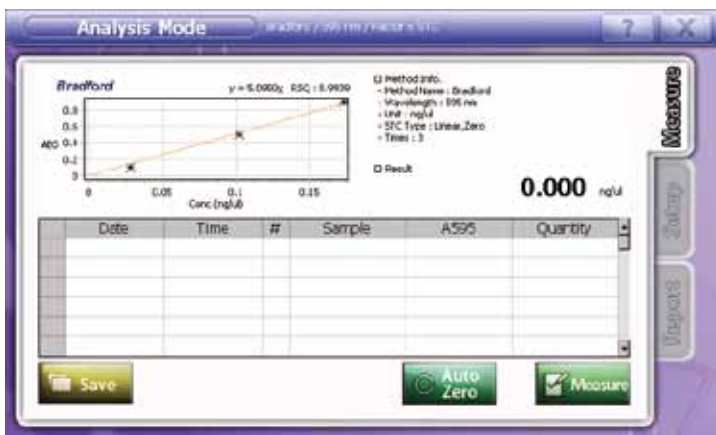


2. Click the desired method once at the sub list of [Protein Analysis].



Detail method info. and standard curve info. will show up on the right bottom window.

3. After checking Method Info., touch  to proceed to analyzing mode.

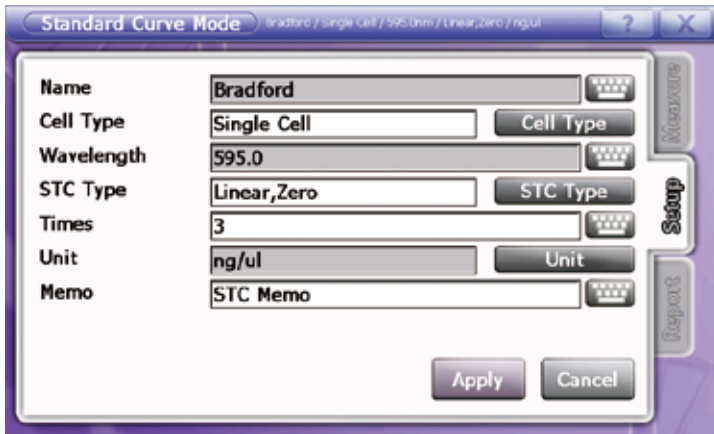


< Standard Curve >

- Double click the standard curve graph at the left upper side of protein analysis window to proceed to standard curve mode. At Standard Curve mode, recently saved standard curve is stored.

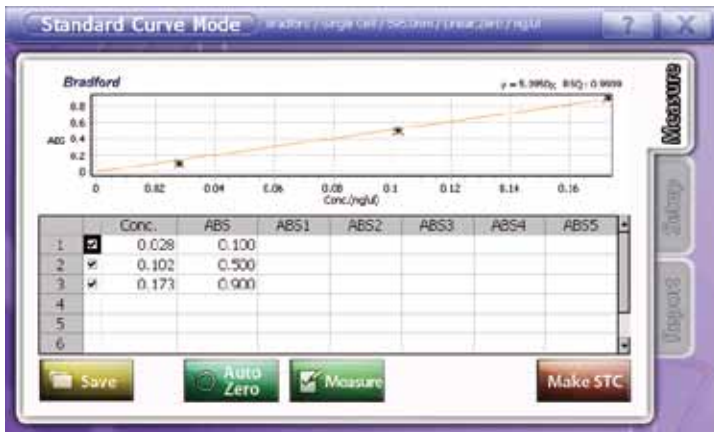


5. Touch [Setup] to set the measuring conditions.



Modify cell type, STC type, measuring times and memo as the experiment conditions. Name, wavelength and unit are not amendable.

6. Touch **Apply** to apply setting. [Measurement] screen will show up.



7. Double click the desired window below [Conc.], and then keypad appears. Input concentrations.

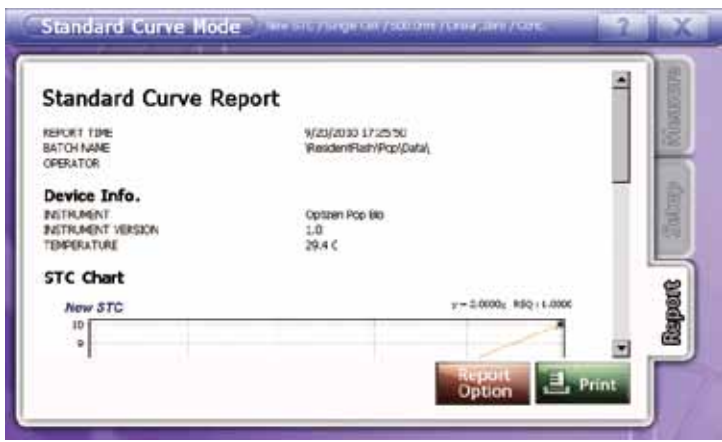
8. Input the blank(reference) sample to cell holder and touch **Auto Zero** to make Auto zero.

9. After making auto zero, input the sample to the proper cell holder and touch **Measure** to measure.

10. Repeat item 9. for more samples.

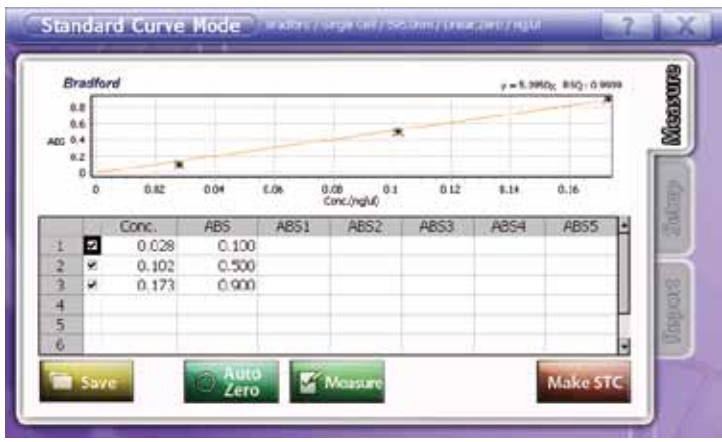
11. Results show up at data table.

12. Touch **Make STC** to draw the standard curve as the pre-set conditions. Chart, formula and RSQ value are also shown up.
13. To save measured data, touch **Save**.
14. Move to [Report] tap to review measured data or print out.




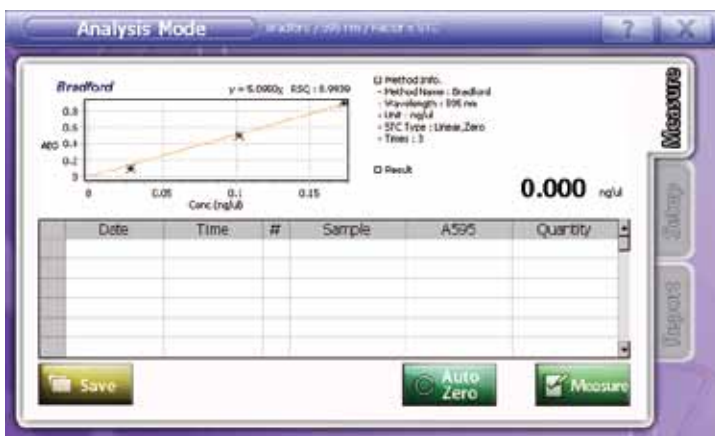
15. Touch **Report Option** to select items to print out. And touch **Apply** to apply. Selected items are applied.
16. Touch **Print** to print out after reviewing.

< Protein Analysis >



17. After creating the standard curve, touch **Save** to save it.

18. Message will appear after saving.
19. Touch  to proceed to protein analysis mode.



20. Touch [Setup] to set the measuring conditions.

Method Name:


Wavelength:

Cell Type:





Quantity Exp.:

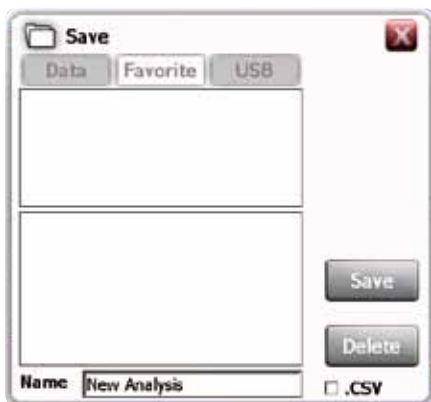
Dilution Factor:

Modify cell type, STC type, measuring times and memo as the experiment conditions. Name, wavelength and unit are not amendable.

21. Touch  to apply setting. [Measurement] screen will show up.

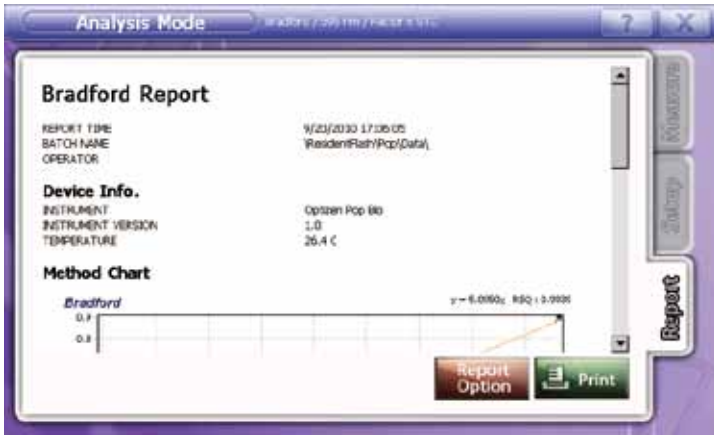




22. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
23. After making auto zero, input the sample to cell holder and touch  to measure.
24. Repeat item 23. for more samples. Results show up at data table and result tap at the right upper side of the window.
25. To save measured data, touch .
26. Select the storage device and folder, Then input file name and touch  to save.




Check at .CSV to save as excel form.

27. Move to [Report] tap to review measured data or print out.



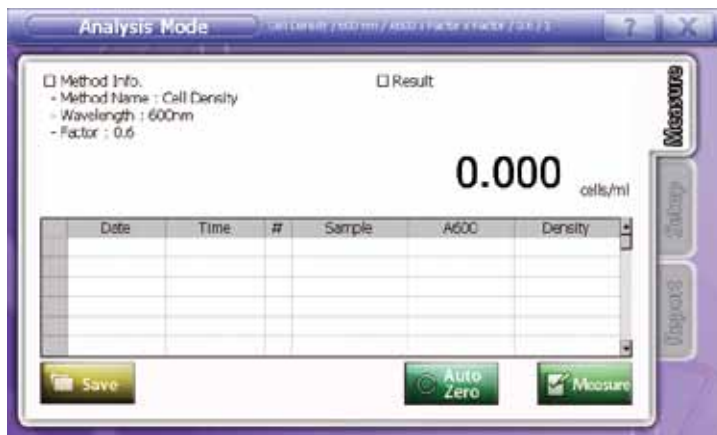
12. Touch  to select items to print out. And touch  to apply. Selected items are applied.

13. Touch  to print out after reviewing.

5. Cell density



This mode is to measure Cell density to determine bacterial cell growth. Results show up at data table and result tap at the right upper side of the window.


1) Measurement








- **Input sample name** – Double click desired window, and keypad appears.
Input sample name.

• Measurement

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

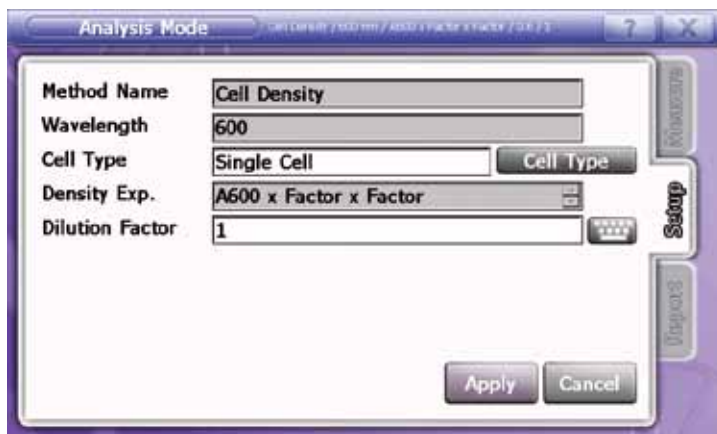
- **Save** - To save measured data, touch  .



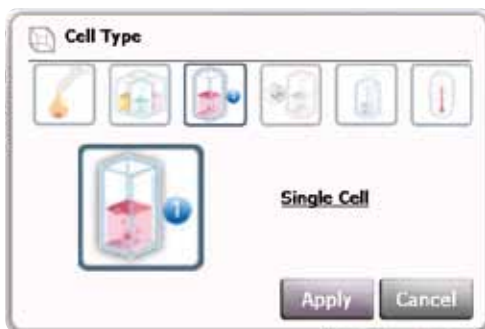
1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.

2) Setup

Setting factors to be applied for measurement. Set up cell type and factor. Method name, wavelength and Density Exp. are not amendable.



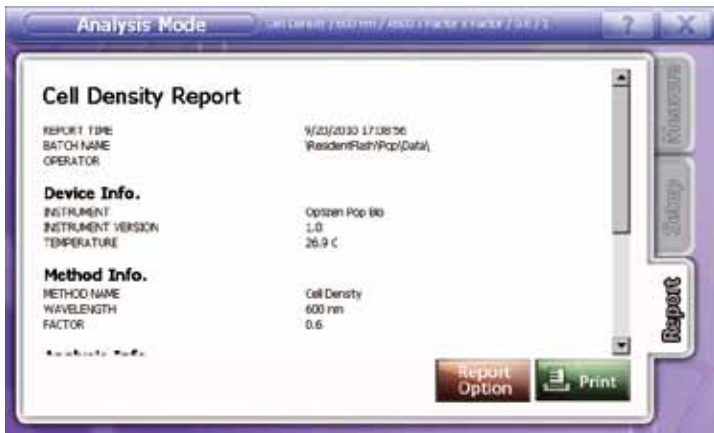
- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)




- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result. Touch **Apply** to input the dilution factor.

3) Report

Preview allows displaying measured data, then print out. Device info, Method Info., Analyze Info. and Analyze data will show up.



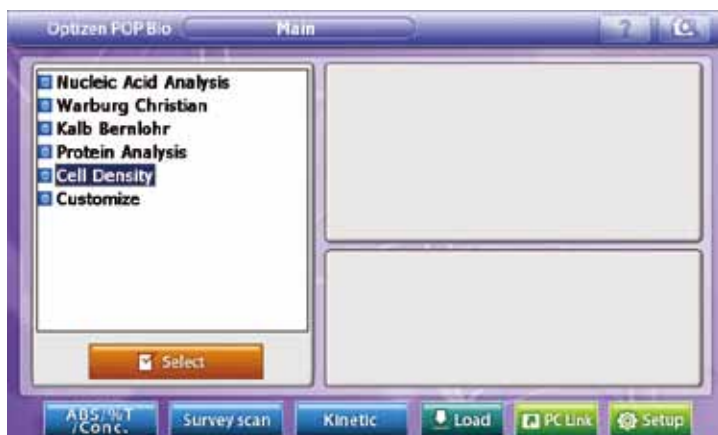
And touch  to select items to print out.



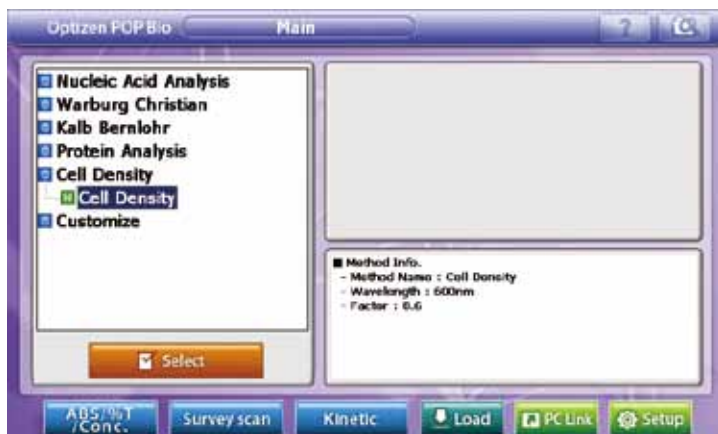
Touch  to print out after reviewing.

4) Cell density Guideline

1. As double clicking [Cell density] at the main menu, the sub list of [Cell density] will show up. Check method list.

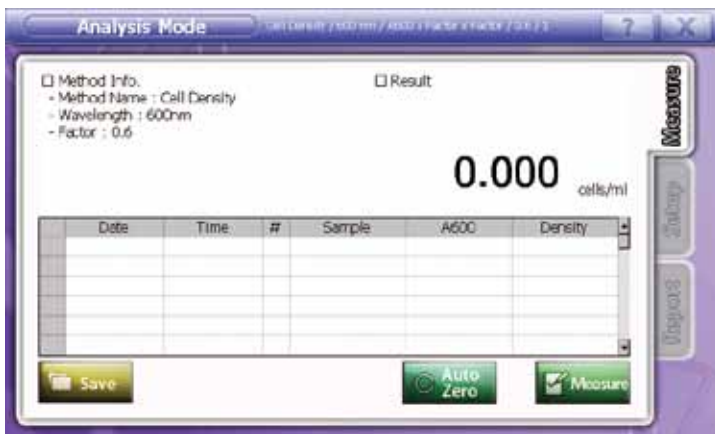


2. Click the desired method once at the sub list of [Cell density].

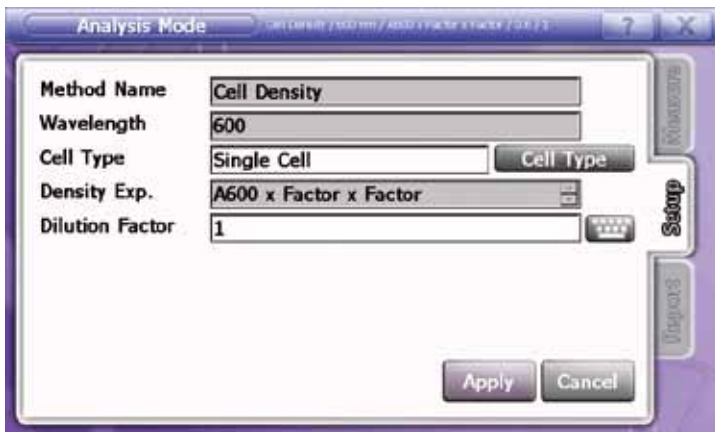


Detail method info. will show up on the right bottom window.

3. After checking Method Info., touch  to proceed to analyzing mode.

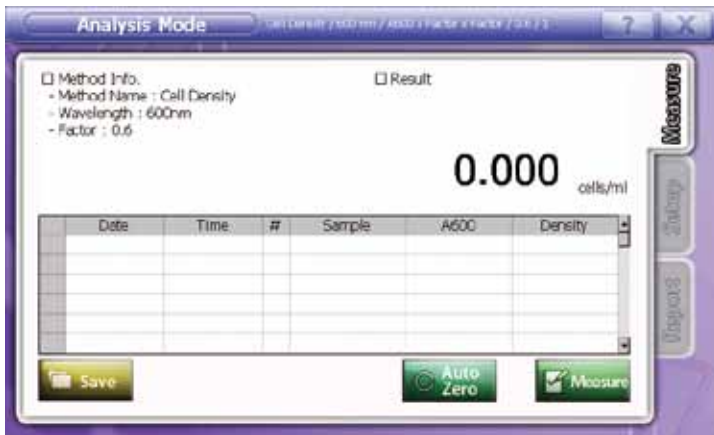






4. Touch [Setup] to set the measuring conditions.

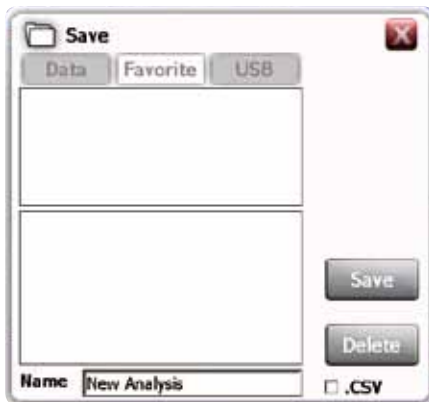


Modify cell type and factor as the experiment conditions. Method name, wavelength and Density Exp. are not amendable.

5. Touch **Apply** to apply setting. [Measurement] screen will show up.

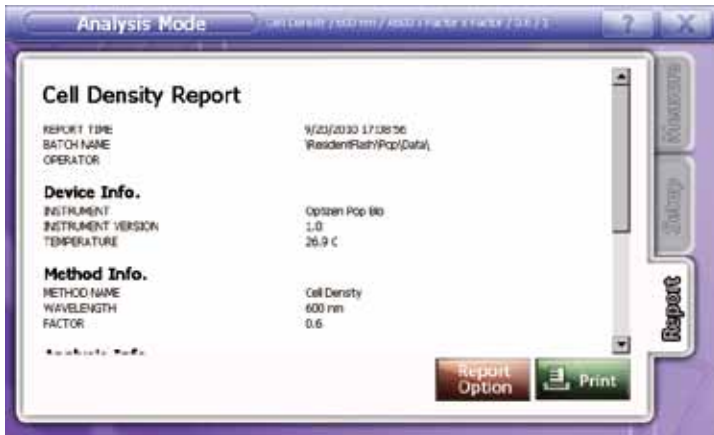




6. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
7. After making auto zero, input the sample to cell holder and touch  to measure.
8. Repeat item 7. for more samples.
9. To save measured data, touch .
10. Select the storage device and folder. Then input file name and touch  to save.




Check at .CSV to save as excel form.

11. Move to [Report] tap to review measured data or print out.



12. Touch  to select items to print out. And touch  to apply. Selected items are applied.

13. Touch  to print out after reviewing.

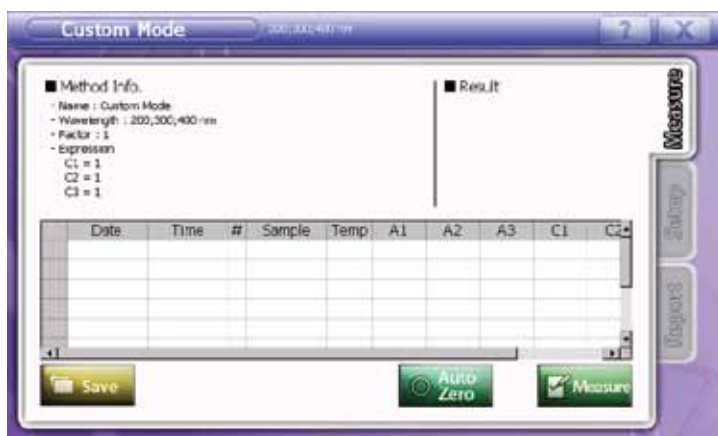
6. Customize

This mode is to check absorbance from multiple wavelengths.

It also provides simple calculation methods.



Results show up at method info and data table at the upper side of the window.

1) Measurement



- **Input sample name** – Double click desired window, and keypad appears.
Input sample name.

• Measurement

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

• **Save** - To save measured data, touch

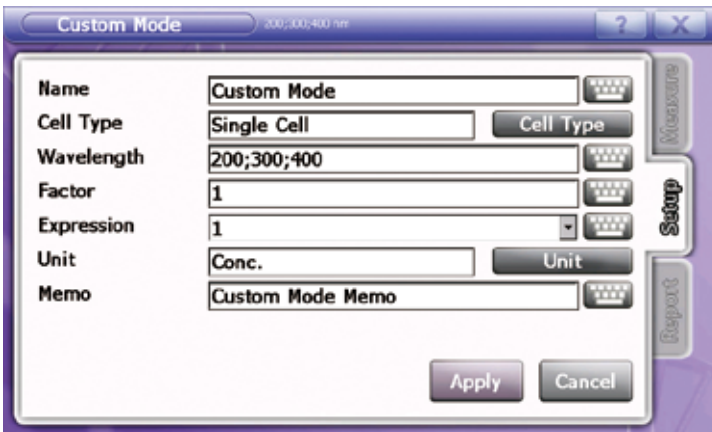


1. Select the storage device from .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch to store.
6. Touch to eliminate the file.

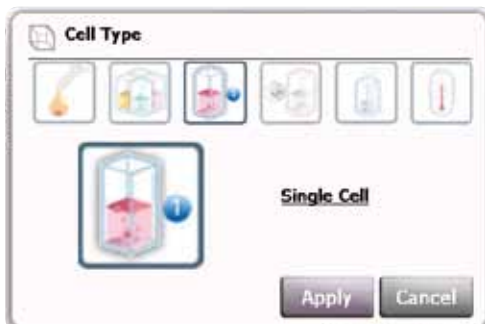
2) Setup

Set up window.

Set cell type, wavelength, factor, expression and unit.

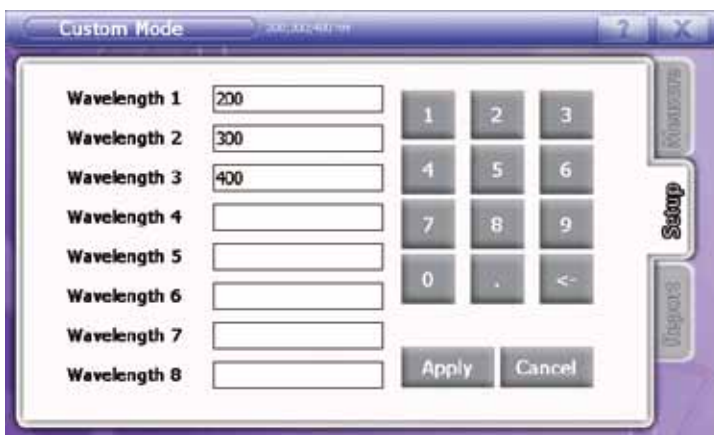



- **Cell type** - Touch **Cell Type** to find proper one and touch **Apply** to apply.
Default setting is Single cell. (Ref : 10. Cell type - 110page)



- **Input wavelengths**

1. Touch  beside wavelengths.



2. Input wavelengths using number pad on the screen.
 3. Input wavelengths between 190nm and 1100nm. It is possible to input to one decimal place and maximum 8 wavelengths.
 4. Touch **Apply**.
- **Factor** - When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result.
Touch  to input the dilution factor.

• **Input expressions**

1. Touch  besides expression.



2. Input expressions using number keypad on the screen. A means measured absorbance values. A1 is the absorbance value of the first wavelength, and A2 is that of the second wavelength.

3. Possible to input +, -, *, /,(,) to expressions.

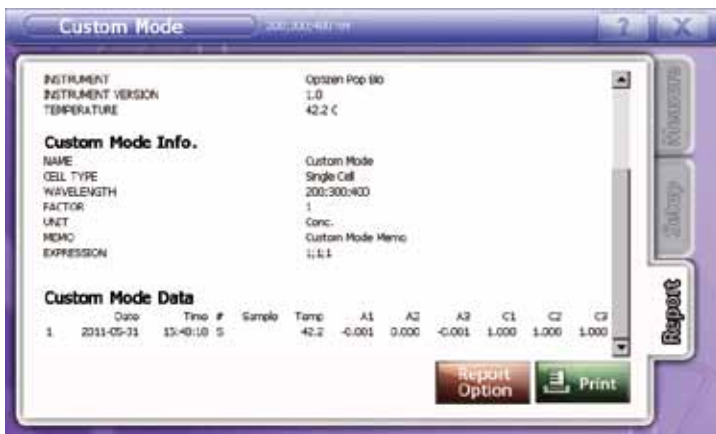
4. Touch  .


3) Report

Preview allows displaying measured data, then print out.


Device info., Custom mode info., and custom mode data is shown at the report.





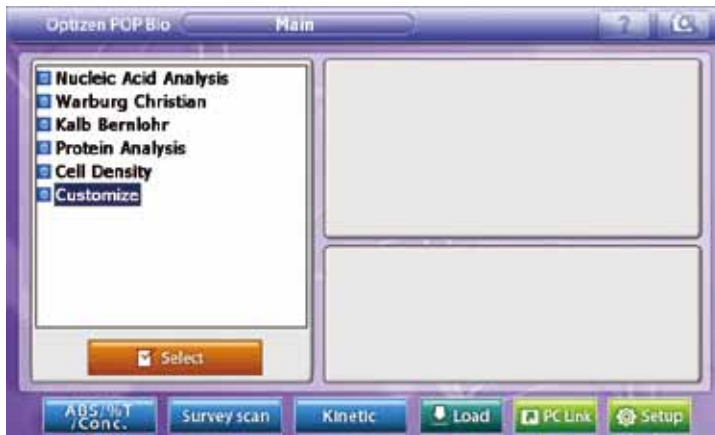
And touch  to select items to print out.



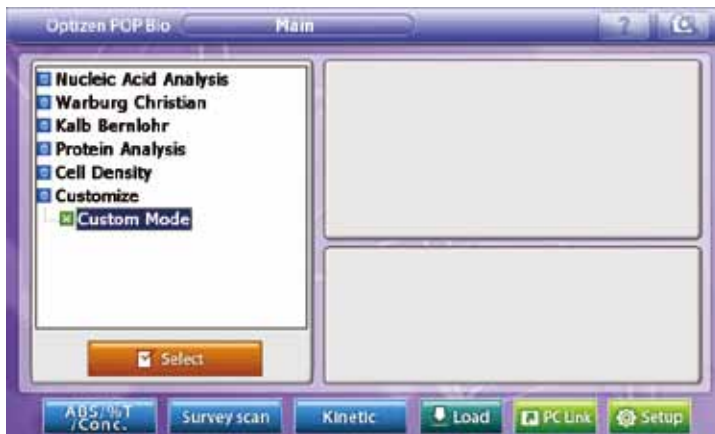
Touch  to print out after reviewing.

4) Customize Guideline

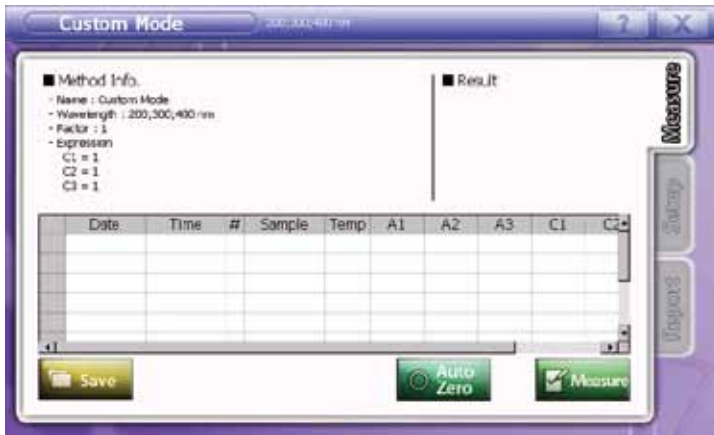
1. As double clicking [Customize] at the main menu, the sub list of [Customize] will show up. Check method list.



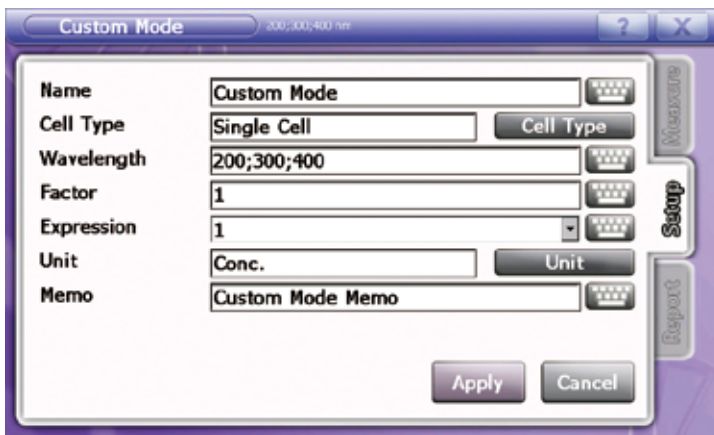
2. Click the Custom mode once at the sub list of [Customize].




3. After checking Method Info., touch  to proceed to analyzing mode.

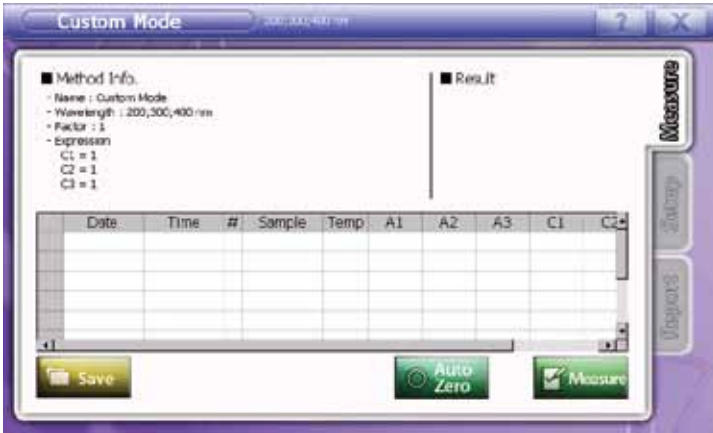



4. Touch [Setup] to set the measuring conditions.




Input cell type, wavelength, factor, expression and unit.


5. Touch  to apply setting. [Measurement] screen will show up.




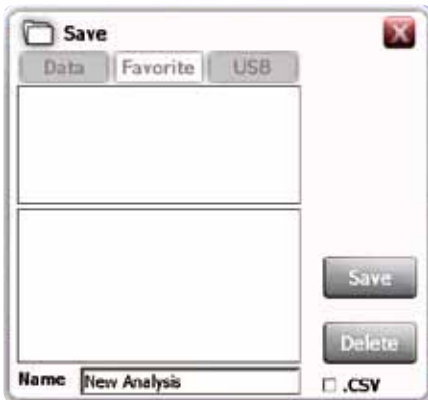
6. Input the blank(reference) sample to cell holder and touch  to make Auto zero.

7. After making auto zero, input the sample to cell holder and touch  to measure.

8. Repeat item 7. for more samples.

9. To save measured data, touch .



10. Select the storage device and folder. Then input file name and touch  to save.




Check at .CSV to save as excel form.

11. Move to [Report] tap to review measured data or print out.



12. Touch  to select items to print out. And touch  to apply. Selected items are applied.


13. Touch  to print out after reviewing.

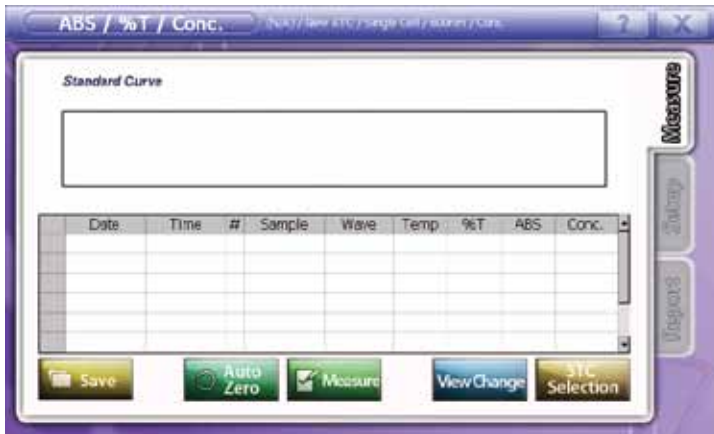
7. ABS/%T/Conc.

This mode is to measure absorption, transmittance, and concentration calculated by applied standard curve at selected wavelength. Results show up at data table and result tap at the right upper side of the window.



7-1. Standard Curve mode



1) How to open standard curve mode

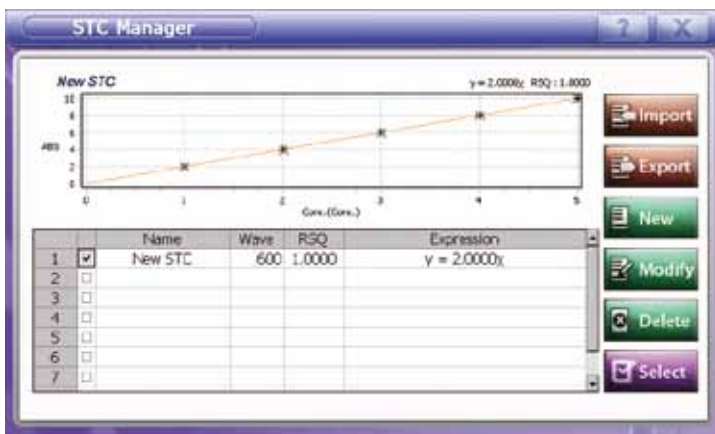
Touch  at ABS / %T / Conc. window to proceed to STC manager.



- STC Manager enables you to draw, modify, select and delete the standard curve and to import and export standard curve files from other data storages.

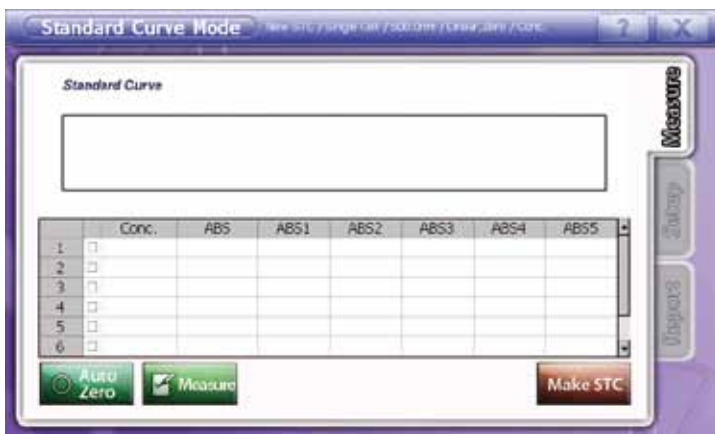
-  : Take STC file from other data storages into STC manager.
-  : Copy STC file from STC manager list to other data storages

To draw or modify the standard curve, touch  or .

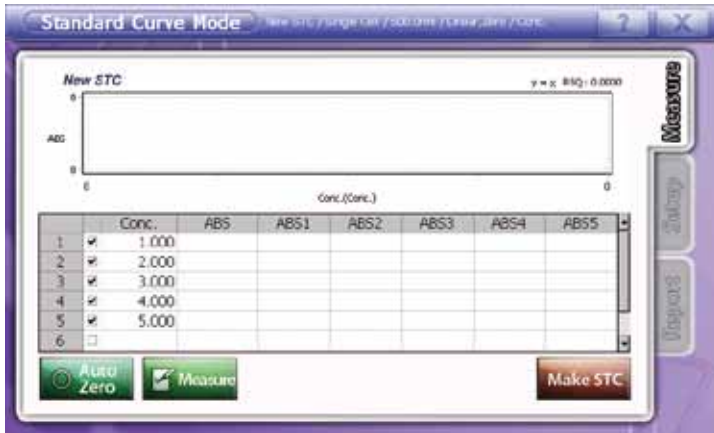


2) Measurement




Input concentration value of standard sample to Conc. orderly, draw standard curve with measuring standard samples.



- **Input concentration** – Double click the desired window below [Conc.], then keypad appears. Input concentrations.




• Measurement

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the first standard sample to cell holder and touch  to measure.
3. Repeat item 2. For more standard samples.
(Max 7 samples can be measured at one time with multi cell holder.)
4. After measuring, OPTIZEN POP bio will draw the standard curve with measured data automatically, and it will also tell you the formula and RSQ value of the standard curve.
5. Each row, there is a mark box to select data. Check a mark box to select data or undo to exclude data and touch .



- **Save**

1. After measuring, touch  to save the created standard curve.
2. It is added to STC manager list.




3) Set up

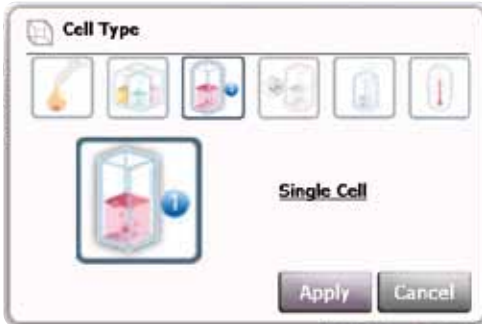
Set factors and functions. Set up name, Cell type, wavelength, STC type, measuring times, unit and memo.


The screenshot shows the 'Standard Curve Mode' Setup screen. At the top, it says 'Standard Curve Mode' and 'New STC / Single Cell / 500.0nm / Linear, zero / Conc.'. Below this are several input fields and buttons:


- Name:** New STC
- Cell Type:** Single Cell (with a 'Cell Type' button)
- Wavelength:** 600.0 (with a numeric keypad icon)
- STC Type:** Linear, Zero (with an 'STC Type' button)
- Times:** 3 (with a numeric keypad icon)
- Unit:** Conc. (with a 'Unit' button)
- Memo:** STC Memo (with a text input field and a keyboard icon)

At the bottom, there are 'Apply' and 'Cancel' buttons. On the right side, there are vertical buttons for 'Measure', 'Setup', and 'Support'.


- **Name** - Touch  and keypad appears. Input STC name.
- **Cell type** - Touch  to find proper one and touch  to apply.
Default setting is Single cell. (Ref : 10. Cell type - 110page)





- **Wavelength** - Touch  to input wavelength. Default setting is 600nm, and possible wavelength ranges are 190~1100nm.

- **STC type** - Touch  and STC type list will show up. Select the proper one among linear (0), linear, quadratic and cubic.





- **Times** - Input the number of measurement for each cell. Touch  and input measuring times, Max. 5.

- **Unit** - Touch  and 9 units show up. Select proper one and touch  to apply.




※**Modify unit list.**

Touch  to modify unit list.

1. Touch , then unit list show up.

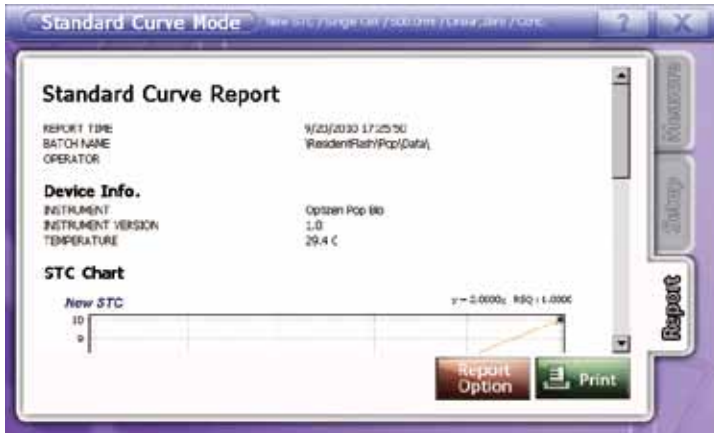



2. Double click unit window to modify, and keypad appears.
3. Input desired unit, and touch enter. Modified unit is applied.
4. Touch  to apply.

- **Memo** - Touch  to write brief information on measurement.

4) Report

Preview allows displaying measured data, then print out. Device info, Standard Curve Chart, Standard Curve Info. and STC data will show up.




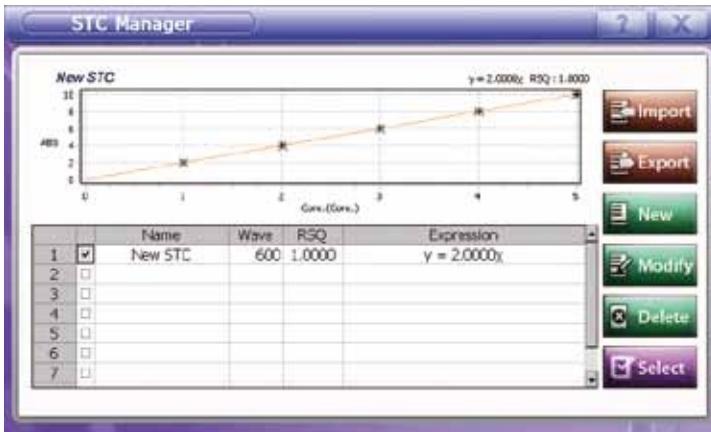
And touch  to select items to print out.



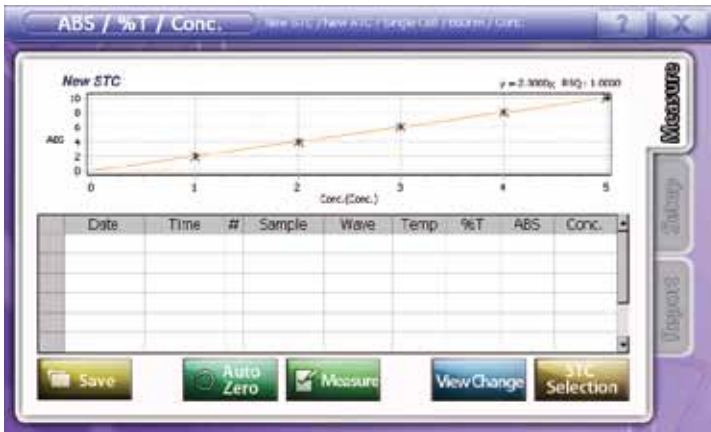
Touch  to print out after reviewing.

7-2. Analyzing mode

Check the standard curve at the STC Manager, and touch  to proceed to ABS / %T / Conc. mode.





1) Measurement








- **Input sample name** – Double click desired window, and keypad appears. Input sample name.

• **Measurement**

1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up at data table and result tap at the right upper side of the window.

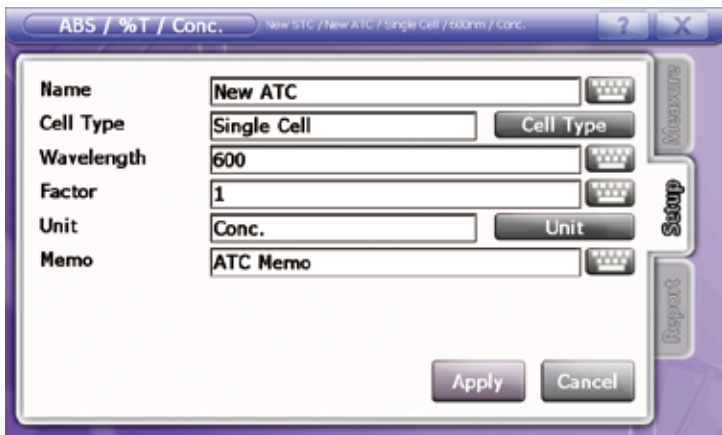
• **Save** - To save measured data, touch  .






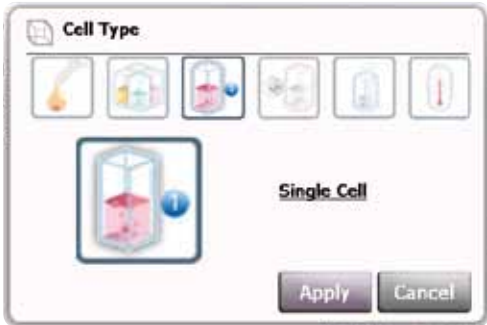
1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.


2) Setup



Set factors and functions. Set up name, Cell type, wavelength, factor, unit and memo. In case of using standard curve, cell type, wavelength and unit is set as those of standard curve.



- **Name** - Touch  and keypad appears. Input file name.
- **Cell type** - Touch  to find proper one and touch  to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)





- **Wavelength** - Touch  to input wavelength. Default setting is 600nm, and possible wavelength ranges are 190~1100nm.
- **Factor** – When the concentration of sample is too high and out of measuring ranges, make the diluted sample and input dilution factor to get the calculated (original) result.

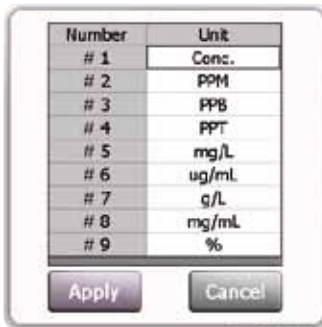
- **Unit** - Touch  and 9 units show up. Select proper one and touch  to apply.





※**Modify unit list.**

Touch  to modify unit list.

1. Touch , then unit list show up.




2. Double click unit window to modify, and keypad appears.
3. Input desired unit, and touch enter. Modified unit is applied.
4. Touch  to apply.

- **Memo** - Touch  to write brief information on measurement.

3) Report

Preview allows displaying measured data, then print out. Device info, STC Chart, STC Info. STC data, ATC Info. and ATC data will show up.




And touch  to select items to print out.

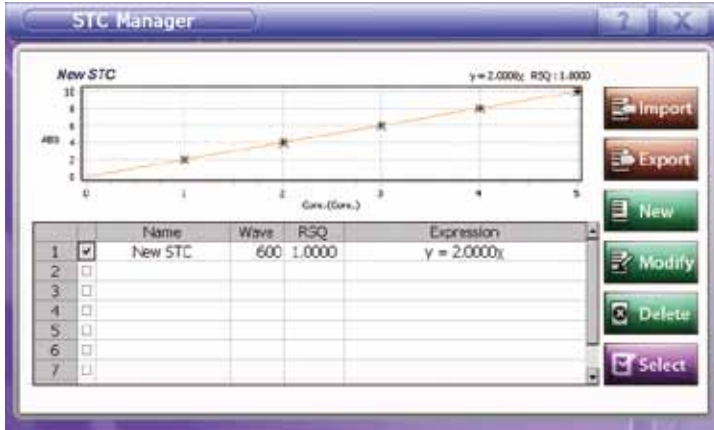





Touch  to print out after reviewing.

7-3. Import/Export

1) Import

1. Touch  .



2. Select the storage device among    to import the file from.




3. Select the folder.

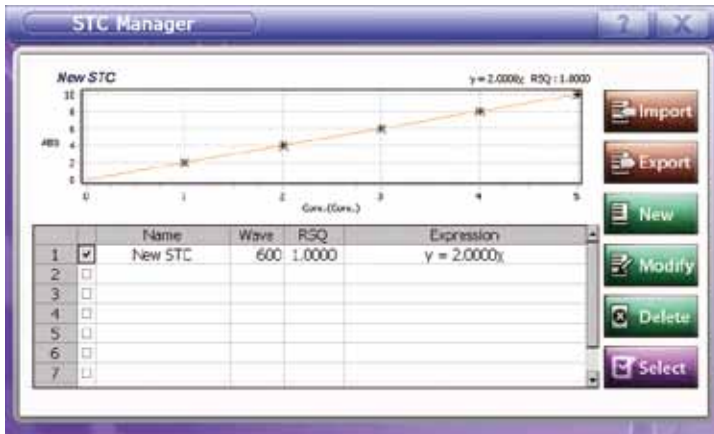
4. Double click the file to open. Check the file name at **Name** .




5. Touch  .

6. Touch  to eliminate the file.

2) Export

1. Mark a STC file, and then touch .




2. Select the storage device among    to export the file to.




3. Select the folder.

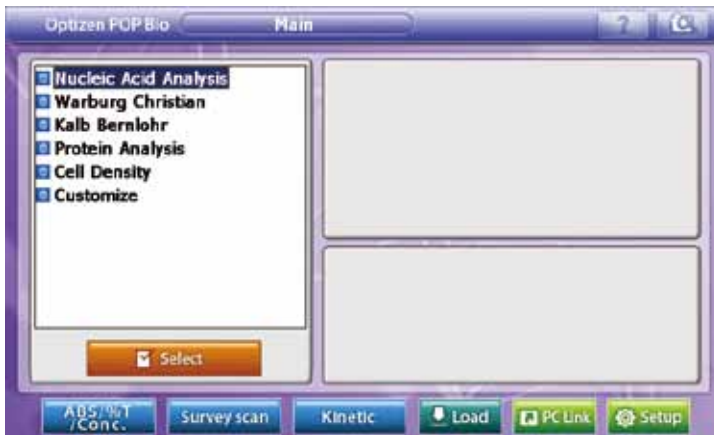
4. Double click **Name** to input file name.


5. Touch .

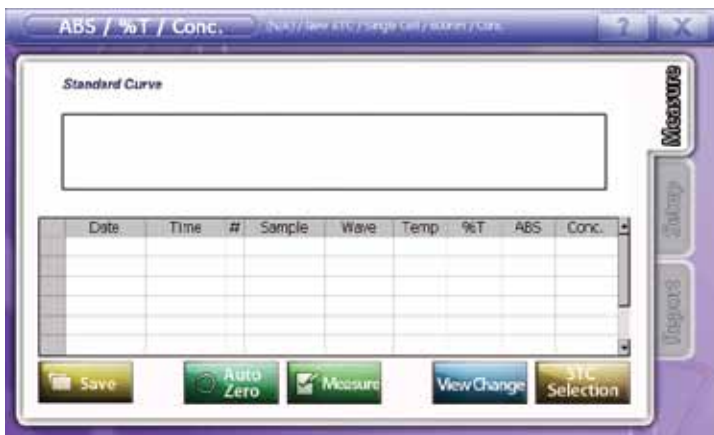
6. Touch  to eliminate the file.



7-4. ABS / %T / Conc. mode Guideline

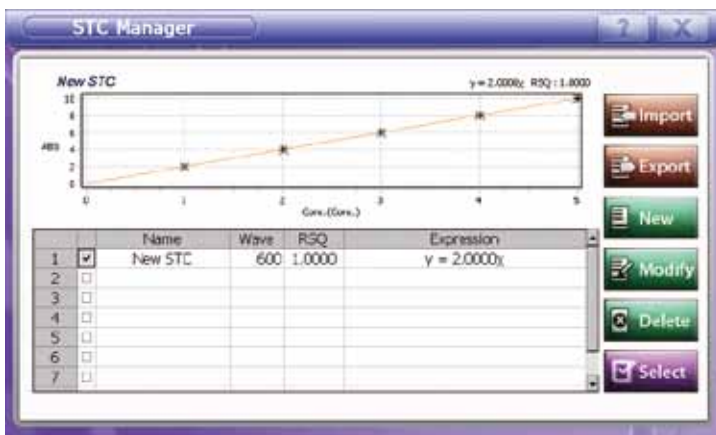
1. Touch  to proceed to ABS / %T / Conc. Mode.



2. At ABS / %T / Conc. mode, touch  to open STC manager.

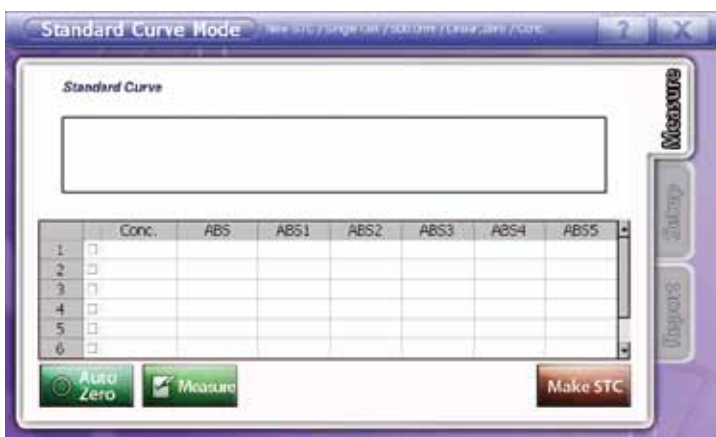


3. To draw or modify the standard curve, touch  or .



< Standard Curve >

4. Proceed to STC mode.



5. Touch [Setup] to set the measuring conditions.

Standard Curve Mode New STC / Single Cell / 500.0nm / Linear,Zero / Conc.

Name: New STC

Cell Type: Single Cell

Wavelength: 600.0

STC Type: Linear,Zero

Times: 3

Unit: Conc.

Memo: STC Memo

Buttons: Measure, Setup, Report, Apply, Cancel

Modify name, cell type, wavelength, STC type, measuring times, unit and memo as the experiment conditions.

6. Touch **Apply** to apply setting. [Measurement] screen will show up.

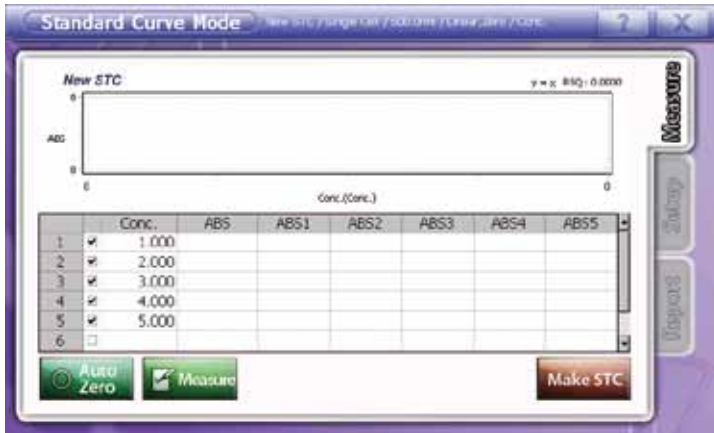
Standard Curve


| | Conc. | ABS | ABS1 | ABS2 | ABS3 | ABS4 | ABS5 |
|---|--------------------------|-----|------|------|------|------|------|
| 1 | <input type="checkbox"/> | | | | | | |
| 2 | <input type="checkbox"/> | | | | | | |
| 3 | <input type="checkbox"/> | | | | | | |
| 4 | <input type="checkbox"/> | | | | | | |
| 5 | <input type="checkbox"/> | | | | | | |
| 6 | <input type="checkbox"/> | | | | | | |


Buttons: Auto Zero, Measure, Make STC

Vertical Buttons: Measure, Setup, Report

7. Double click the desired window below [Conc.], and then keypad appears. Input concentrations.




8. Input the blank(reference) sample to cell holder and touch  to make Auto zero.

9. After making auto zero, input the sample to the proper cell holder and touch  to measure.

10. Repeat item 9. for more samples.

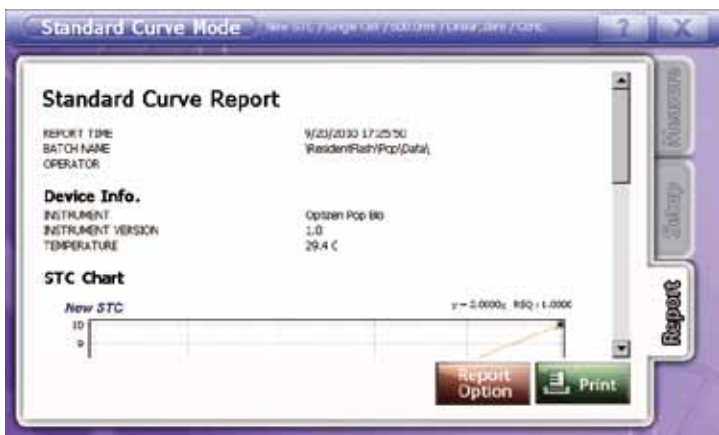
11. Results show up at data table.



12. Touch  to draw the standard curve as the pre-set conditions. Chart, formula and RSQ value are also shown up.

13. To save measured data, touch  . It is added to STC manager list.

14. Move to [Report] tap to review measured data or print out.

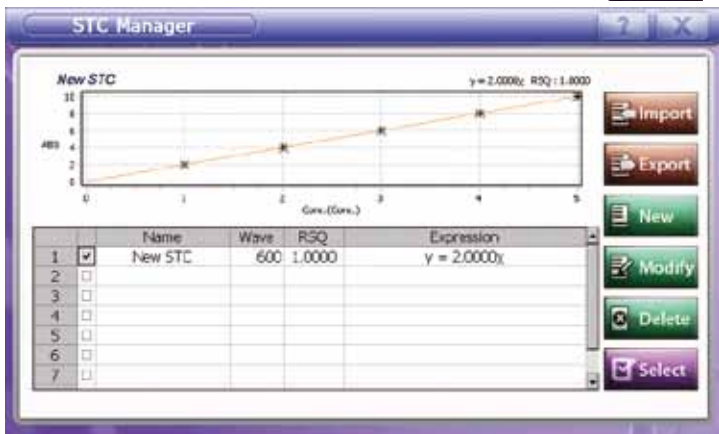


15. Touch **Report Option** to select items to print out. And touch **Apply** to apply. Selected items are applied.

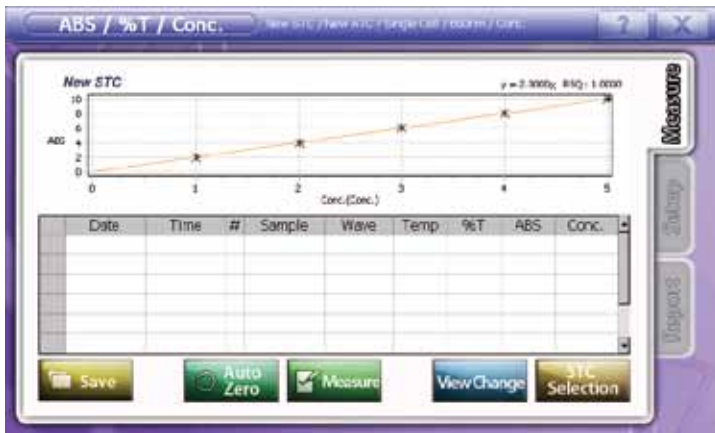
13. Touch **Print** to print out after reviewing.

< **ABS / %T / Conc Analysis** >

17. Check the standard curve at the STC Manager and touch **Select**.



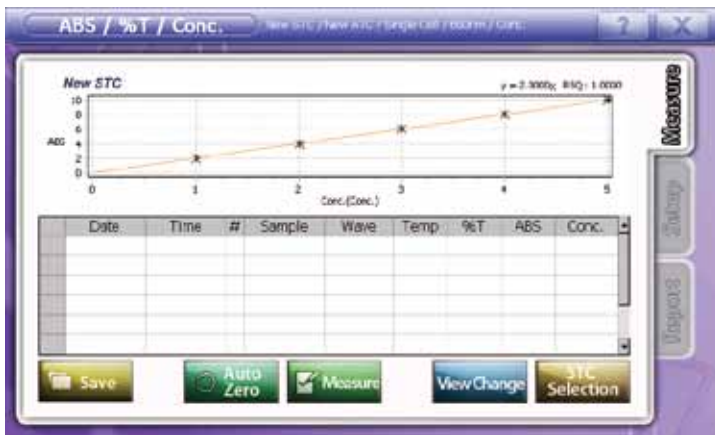
18. Proceed to ABS / %T / Conc. mode.







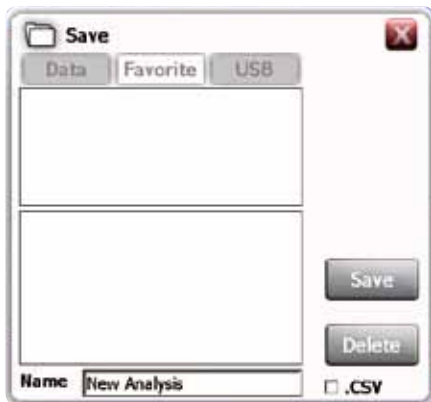
19. Touch [Setup] to set the measuring conditions.

Modify name, cell type, wavelength, factor, unit and memo as the experiment conditions. In case of using standard curve, cell type, wavelength and unit is set as those of standard curve.

20. Touch **Apply** to apply setting. [Measurement] screen will show up.

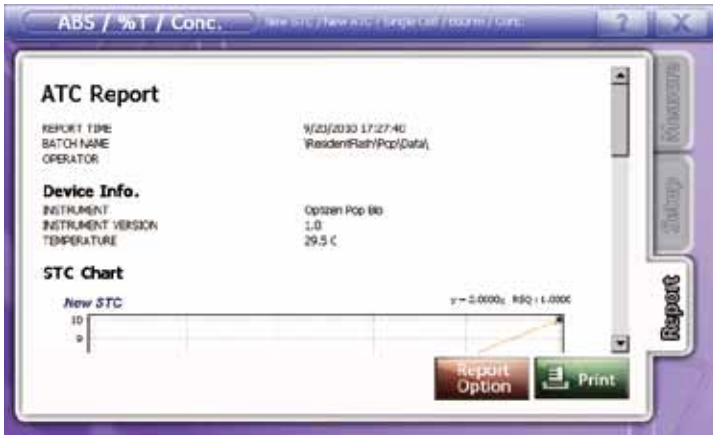




21. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
22. After making auto zero, input the sample to cell holder and touch  to measure.
23. Repeat item 7. for more samples.
24. To save measured data, touch  .
25. Select the storage device and folder. Then input file name and touch  to save.




Check at .CSV to save as excel form.

26. Move to [Report] tap to review measured data or print out.



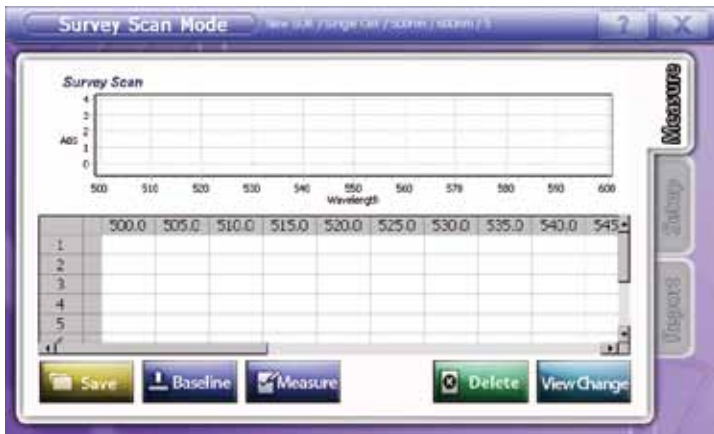
27. Touch  to select items to print out. And touch  to apply. Selected items are applied.

28. Touch  to print out after reviewing.



8. Survey Scan

This mode is to create graph and table at the specific wavelength ranges by selected wavelength interval. At each selected wavelength range, transmittance and absorption are valued.

1) Measurement



• Measurement




1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up as chart and table.




- **Hide Chart** – Each row, there is a mark box to select chart. Check a mark box to show chart or undo to exclude chart.
- **Measuring info** – touch **View Change** to convert the screen as Chart + Data, Chart and Data forms. At Chart forms, Functions such as Zoom, Zoom out, Move graph, %T/ABS conversion, and peak/valley are available.








| No. | Button | Description |
|-----|--------|--|
| 1 | | Enlarge chart. |
| 2 | | Minimize chart (Return to original size) |
| 3 | | Move chart to the left |
| 4 | | Move chart to the right. |
| 5 | | Move chart to the upper direction. |
| 6 | | Move chart to the bottom |
| 7 | | Change data format to transmittance. |
| 8 | | Change data format to absorbance. |
| 9 | | When Peak/Valley appears, click cursor to check Absorbance(Transmittance) and wavelength value |
| 10 | | Move cursor to the left. |

| | | |
|----|---|-------------------------------------|
| 11 |  | Move cursor to the right. |
| 12 |  | Show Peak & Valley points of graph. |
| 13 |  | Change Peak/Valley Setting |

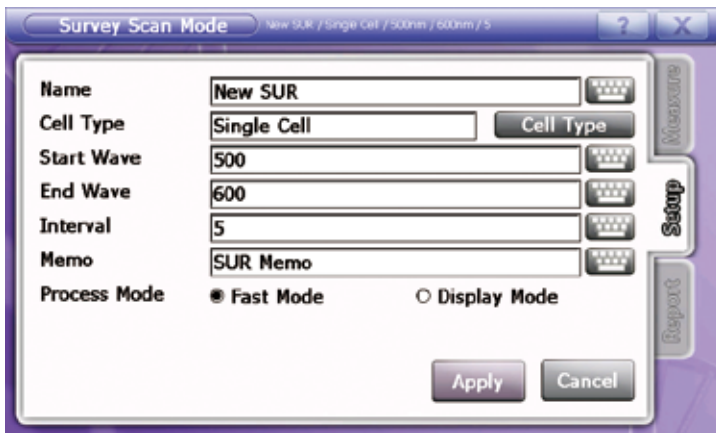
• **Save** - To save measured data, touch  .



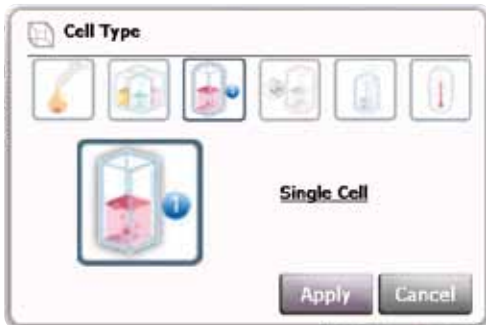
1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.

2) Setup

This step allows setting factors to be applied for measurement. Set up name, Cell type, start wavelength, end wavelength, interval, memo and process mode.



- **Name** - Touch and keypad appears. Input file name.
- **Cell type** - Touch to find proper one and touch to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)



- **Start Wavelength** - Touch to input start wavelength. Default setting is 600nm, and possible wavelength ranges are 190~1100nm.
- **End Wavelength** - Touch to input end wavelength. Default setting is 600nm, and possible wavelength ranges are 190~1100nm.
- **Interval** - Touch to set the scanning steps.
- **Memo** - Touch to write brief information on measurement.

• **Process Mode**


Fast Mode : Measure without showing process Bar and show all data at once. It is unable to cancel or check the progress during this measurement but fast.

Display Mode : Users can check the progress from the process bar. It is possible to stop the measurement by clicking cancel button.


3) Report

Preview allows displaying measured data, then print out. Device info, Survey Scan Chart, Survey Scan Info. and Survey Scan Data will show up.



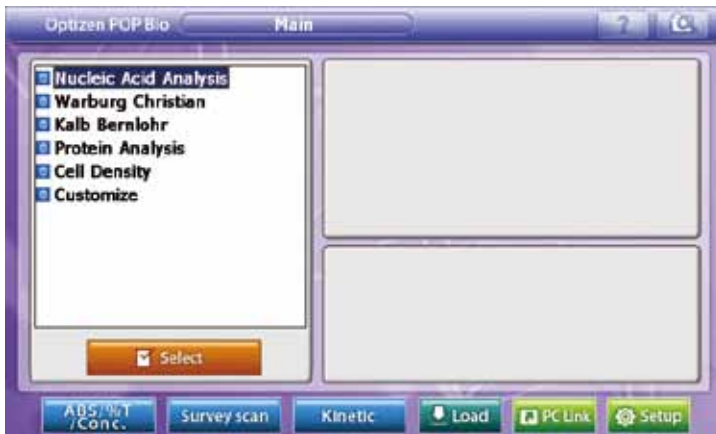
And touch  to select items to print out.



Touch  to print out after reviewing.

4) Survey Scan mode Guideline

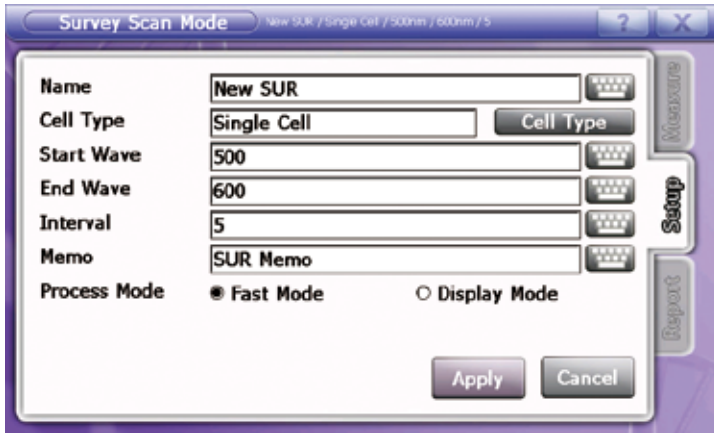
1. Touch **Survey scan** at the main screen to proceed to Survey Scan Mode.



2. Touch **Setup** to set the measuring conditions.



3. Modify name, cell type, start wavelength, end wavelength, interval, memo and Process mode as the experiment conditions.



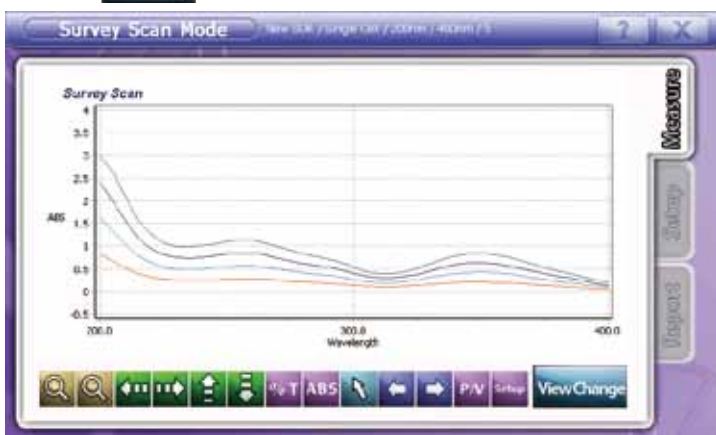
4. Touch **Apply** to apply setting. [Measurement] screen will show up.





5. Input the blank(reference) sample to cell holder and touch **Baseline** to make Auto zero.
6. After making baseline, input the sample to cell holder and touch **Measure** to measure.
7. Repeat item 6. for more samples.
8. Results show up as chart and table.



9. Touch **View Change** to convert the screen as Chart + Data, Chart and Data forms.



10. To save measured data, touch  .



11. Select the storage device and folder, Then input file name and touch  to save.




Check at **.CSV** to save as excel form.

12. Move to [Report] tap to review measured data or print out.



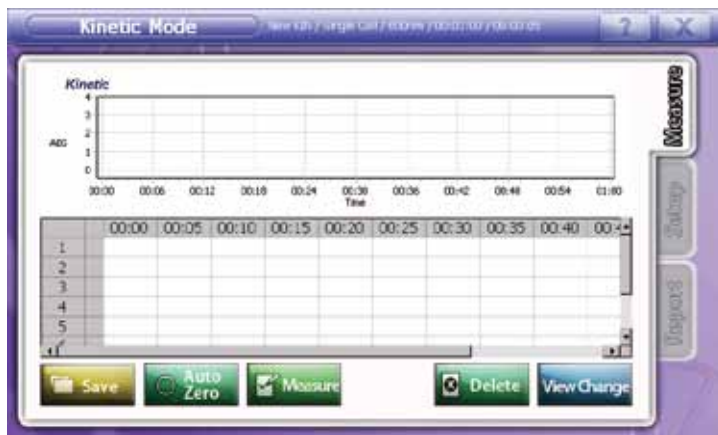
13. Touch  to select items to print out. And touch  to apply. Selected items are applied.



14. Touch  to print out after reviewing.

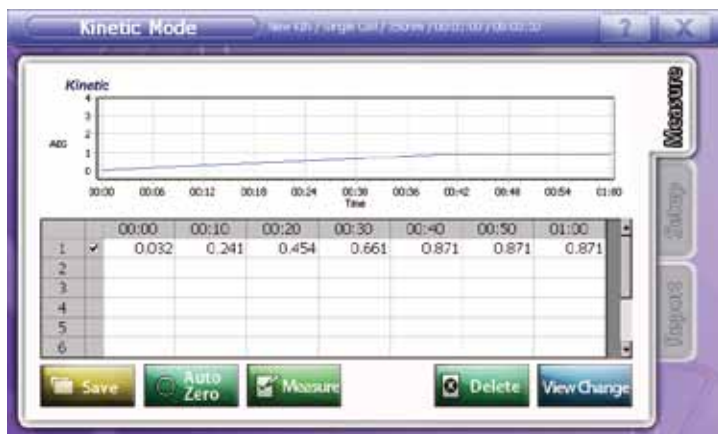
9. Kinetic

This mode is to get variable with time differences. It is easy to check the values of reacting samples. Results show up as table and graph forms.

1) Measurement



1. Input the blank(reference) sample to cell holder and touch  to make Auto zero.
2. After making auto zero, input the sample to cell holder and touch  to measure.
3. Repeat item 2. for more samples.
4. Results show up as chart and table.




- **Hide Chart** – Each row, there is a mark box to select chart. Check a mark box to show chart or undo to exclude chart.






- **Measuring info** – touch **View Change** to convert the screen as Chart + Data, Chart and Data forms. At Chart forms, Functions such as Zoom, Zoom out, Move graph, %T/ABS conversion, and activity are available.



| No. | Button | Description |
|-----|--------|--|
| 1 | | Enlarge chart. |
| 2 | | Minimize chart (Return to original size) |
| 3 | | Move chart to the left |
| 4 | | Move chart to the right. |
| 5 | | Move chart to the upper direction. |
| 6 | | Move chart to the bottom |
| 7 | | Change data format to transmittance. |
| 8 | | Change data format to absorbance. |
| 9 | | When Peak/Valley appears, click cursor to check Absorbance(Transmittance) and wavelength value |
| 10 | | Move cursor to the left. |
| 11 | | Move cursor to the right. |
| 12 | | Show activity data of pre-set time ranges. |

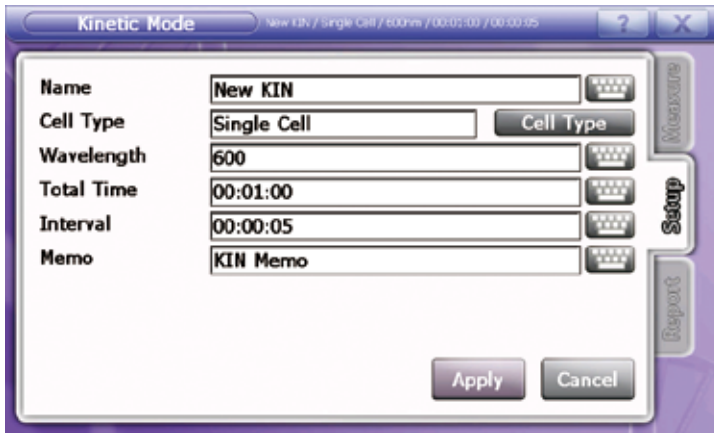
- **Save** - To save measured data, touch  .






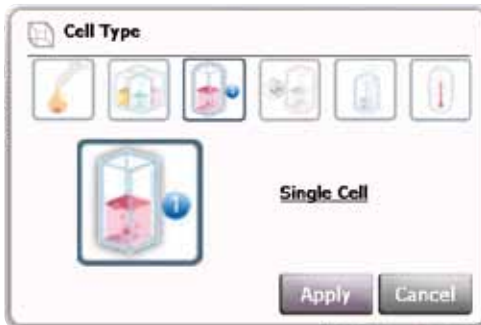
1. Select the storage device from    .
2. Select the folder.
3. Double click **Name** to input file name. Or select the file to be overwritten. Check the file name at **Name** .
4. Check at **.CSV** to save as excel form.
5. Touch  to store.
6. Touch  to eliminate the file.





2) Setup

This step allows setting factors to be applied for measurement. Set up name, Cell type, wavelength, total time, interval and memo.



- **Name** - Touch  and keypad appears. Input file name.
- **Cell type** - Touch  to find proper one and touch  to apply. Default setting is Single cell. (Ref : 10. Cell type - 110page)




- **Wavelength** - Touch  to input wavelength. Default setting is 600nm, and possible wavelength ranges are 190~1100nm.
- **Total time** - Touch  to input total time.
- **Interval** - Touch  to set time interval.
- **Memo** - Touch  to write brief information on measurement.


3) Report

Preview allows displaying measured data, then print out. Device info, KIN Chart, KIN Info. and KIN Data will show up.



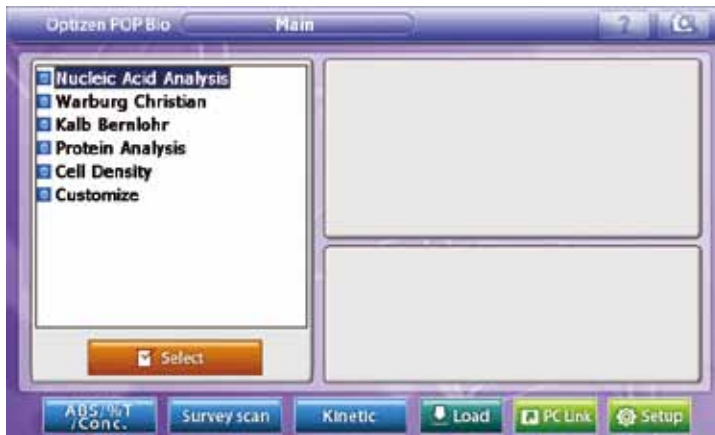
And touch  to select items to print out.



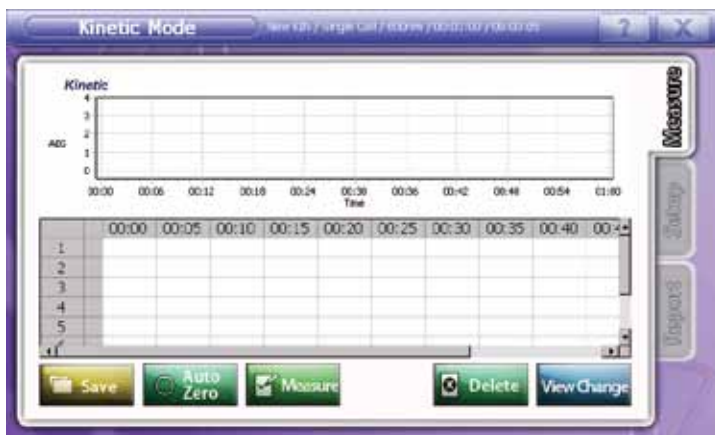
Touch  to print out after reviewing.

4) Kinetic mode Guideline

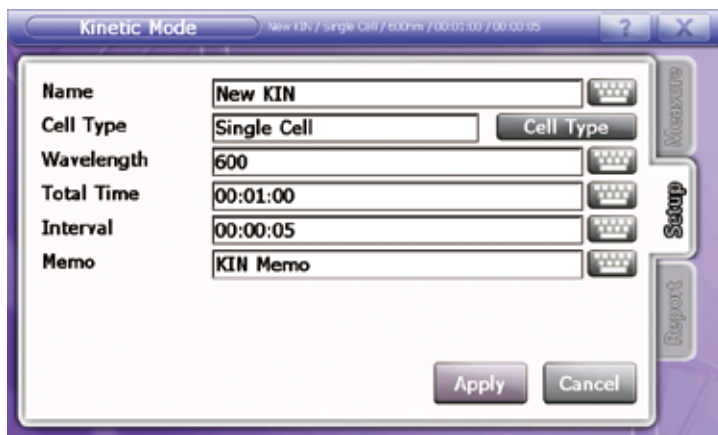
1. Touch **Survey scan** at the main screen to proceed to Kinetic Mode.



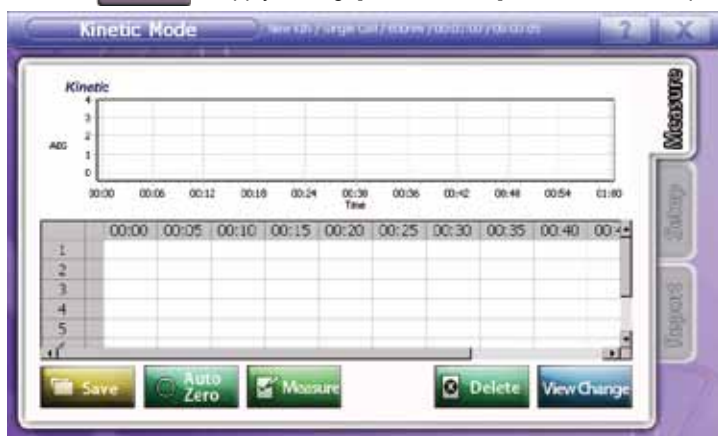
2. Touch **Setup** to set the measuring conditions.



3. Modify name, cell type, wavelength, total time, interval, and memo as the experiment conditions.



4. Touch **Apply** to apply setting. [Measurement] screen will show up.





5. Input the blank(reference) sample to cell holder and touch **Auto Zero** to make Auto zero.
6. After making baseline, input the sample to cell holder and touch **Measure** to measure.
7. Repeat item 6. for more samples.
8. Results show up as chart and table.



9. Touch **View Change** to convert the screen as Chart + Data, Chart and Data forms.



10. To save measured data, touch  .



11. Select the storage device and folder, Then input file name and touch  to save.




Check at .CSV to save as excel form.

12. Move to [Report] tap to review measured data or print out.



13. Touch  to select items to print out. And touch  to apply. Selected items are applied.

14. Touch  to print out after reviewing.

10. Cell type

1) Nano Liter Cell

Nano Liter Cell to measure extremely small amounts of sample, only 3ul ~ 5ul samples are needed.

1. Select Nano Liter Cell.



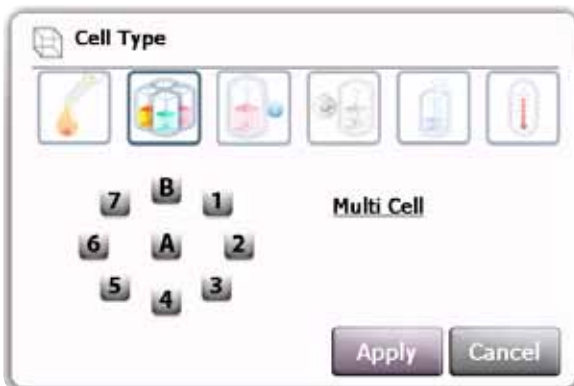
2. Select the proper Path Length. (0.2mm : 0.7~3ul(Optional), 1.0mm : 3~5ul)

3. Touch .

2) Multi Cell

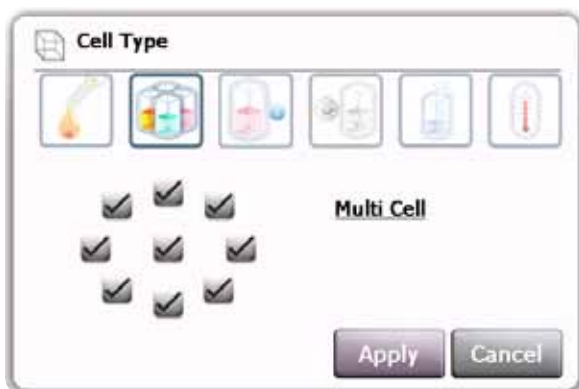
Rotary type Multi Cell Holder to measure numbers of samples.

1. Select Multi Cell.



2. Check cell number to be measured.

3. Check [A] to use all the 8 cells.

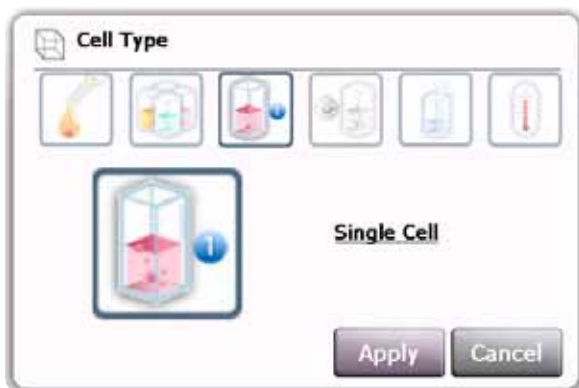


4. Touch .

3) Single Cell

Mode for Single Cell, Round Cell, Film Cell and Long Path Cell.

1. Select Single Cell.




2. Touch .

4) Sipper Cell


Mode for Sipper Cell(Flow cell). Aspiration and measurement are regulated by sipper module.

1. Select Sipper Cell.



3. Touch .
4. Proceed to measure mode after setup

Cautions : Aspiration


At the aspiration step, you can see twice aspirations upon clicking ASP button on the Sipper or touching .




The first aspiration is the sample aspiration as the volume set at the Calibration – Sample mode.

And the second aspiration is the air aspiration for the feeding - moving samples to the measuring point of flow through cell with air.




Please make it sure to aspirate the sample at the first aspiration only and remove the sample tube at the second aspiration for feeding.

• Measuring with Optizen Sipper




Manual Mode : Measure after aspirating the sample using ASP button on the Sipper or .

- a.  Do not check anything.
- b. Aspirate the blank sample using ASP button on the Sipper or .
- c. Touch Auto zero / Baseline.
- d. Aspirate the samples using ASP button on the Sipper or .
- e. Touch measure.

Aspirate before Measure : As touching , it will aspirate the sample automatically and measure.

- a.  Check Aspirate before Measure.
- b. Aspirate the blank sample using ASP button on the Sipper or .
- c. Touch Auto zero / Baseline.
- d. Prepare the sample tubes.
- e. Upon touching  button, it will aspirate the sample automatically and after aspiration, it will measure.
- f. Repeat item.e as the sample numbers.

Aspirate after Measure : After measuring the sample, and then aspirate the next sample automatically.

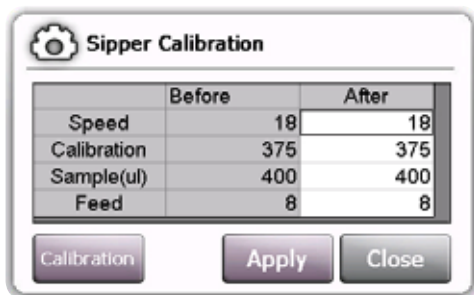
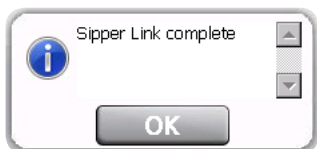
- a.  Check Aspirate after Measure.
- b. Aspirate the blank sample using ASP button on the Sipper or .
- c. Touch Auto zero / Baseline.
- d. Prepare the sample tubes.
- e. Upon touching  button, it will measure the sample, and then aspirate the next sample automatically.
- f. Repeat item.e as the sample numbers.

• **Calibration**

Touch [Calibration] to set the conditions of the Sipper.

Check the connection of the Sipper. If it is OK, it will show below message. Then touch [OK] to proceed to calibration mode.

If it is not OK, it will show [Check Sipper Cable] message. Then check connection once again.



User can define every items on calibration window.

But it may cause malfunctions.

'Before' line shows current values, and 'After' line shows the values to be replaced.

To modify the calibration value, input the new values at the 'After' line windows, then touch [Apply]. You can see the changes at the 'Before' line.

Check and touch [Close].

| Name | Description | Details |
|--------------------|---|---|
| Speed | Aspiration speed. | You can select from 1 to 30. Set as the measuring conditions. |
| Calibration | Revolutions(rotating numbers) of the peristaltic pump per specific volumes. | You can select from 50 to 500. We recommend not to modify it as you choose but to use automatic calibration mode. The calibration values can be changed upon Speed, Tube size and so on. If the real aspirated volume is different with the set volume, correct it at the automatic calibration mode. |

| | | |
|---------------|--|---|
| Sample | The sample aspiration volume. | You can select from 200 to 5000. The unit is μl . |
| Feed | The air aspiration volume to move samples to the measuring point of flow through cell. | As it can be changed upon Tube length, check if the sample arrives at the measuring point before measuring. |

- **Automatic Calibration (Aspiration volume calibration)**

[Calibration] button at this window is to calibrate the aspiration volume automatically. As you touch [Calibration] button, CAL LED on the sipper will be turned on and sipper proceed to calibration waiting mode.

Usage

1. It is done by calculating revolutions(rotating numbers) of the peristaltic pump per specific sample volume($5 \mu\text{l}$).
Please prepare $5 \mu\text{l}$ of D.W. before calibration.
2. Touch [Calibration] button to proceed to calibration waiting mode.
3. Aspirate $5 \mu\text{l}$ of D.W. by pushing CAL button on the sipper.
Please note to keep pushing the button until aspirating the whole sample.
Caution : Pay attention that aspiration is not interrupted.
4. After the end of aspiration, stop pushing the CAL Button.
5. It will calculate the calibration value automatically at the S/W window.
After checking, if the calibration procedures and the values are OK, touch [Apply]

5) Micro Volume Cell

Mode for Micro Volume Cell.

1. Select Micro Volume Cell.

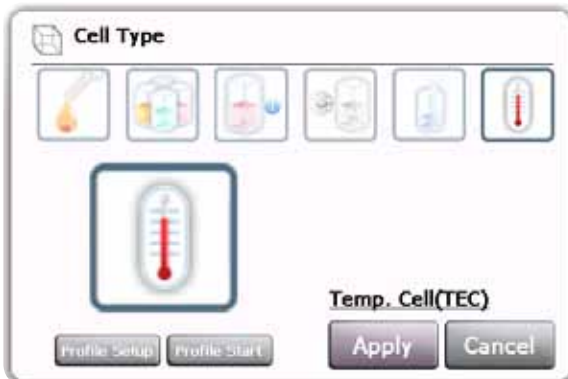



2. Touch  .

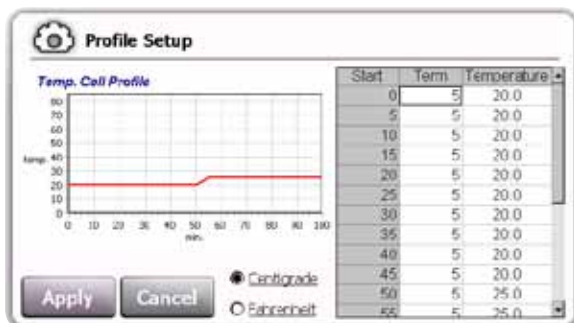
6) Temperature Cell

Mode for Temperature Cell Holder precisely regulated by TEC Control System (Peltier type) module. (5~85 μl)

1. Select Temp. Cell(TEC).



2. Touch  to set the temperature control conditions.



3. Input Term(duration time) and Temperature.

Double click the intended window and input using keypad.

Ex) 0min~10min (duration : 10minutes) : 20°C

10min~60min (duration : 50minutes) : 40°C

60min~70min (duration : 10minutes) : 20°C

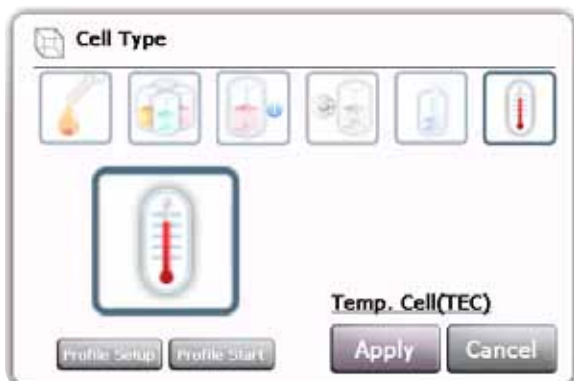
| Start | End | Temperature |
|-------|-----|-------------|
| 0 | 10 | 20 |
| 10 | 50 | 40 |
| 60 | 10 | 20 |

4. Graph shows temperature profile.

5. Centigrade and Fahrenheit convertible.

Temperature will be changed automatically upon your choice.

6. Touch **Apply** to end the setting.



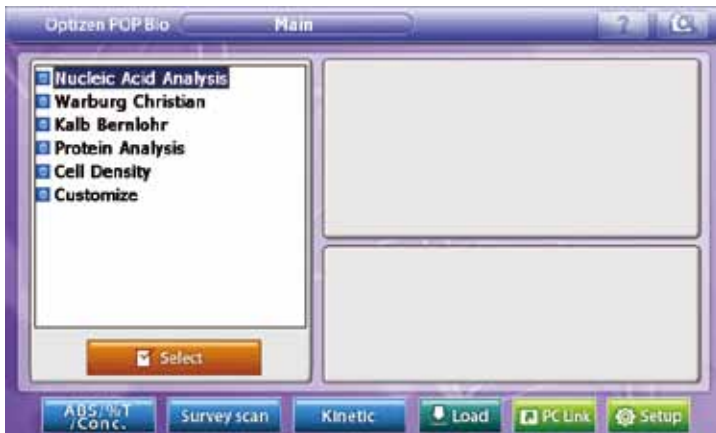
7. Touch **Profile Start** to start temperature control.


8. Touch  .

9. TEC Control System shows temperature status.



11. File browser

It is possible to copy or delete the file between internal and external storage devices.




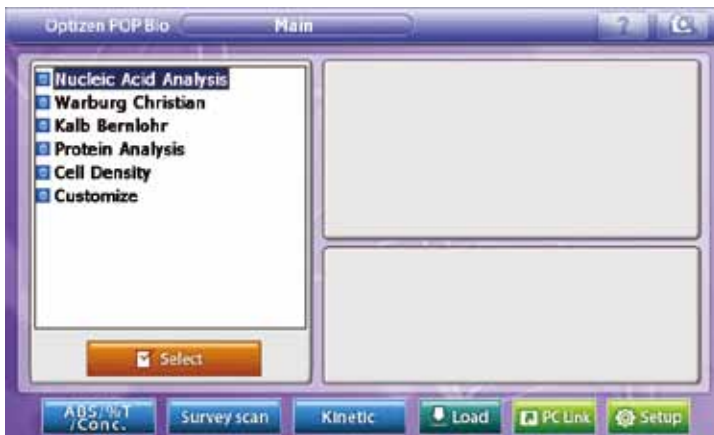
1. Touch  at main menu to move File Browser mode.



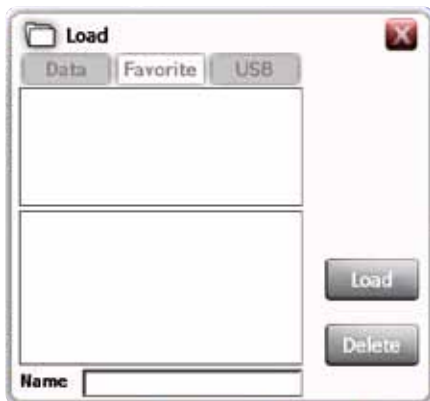
2. Select the storage device.
3. Select the folder.
4. Check the files to copy. (Multi select available.)
5. Touch  to copy.
6. Select the storage device to paste.
7. Select the folder.
8. Touch  to paste.





12. File open

Touch  at main screen to open measured data.




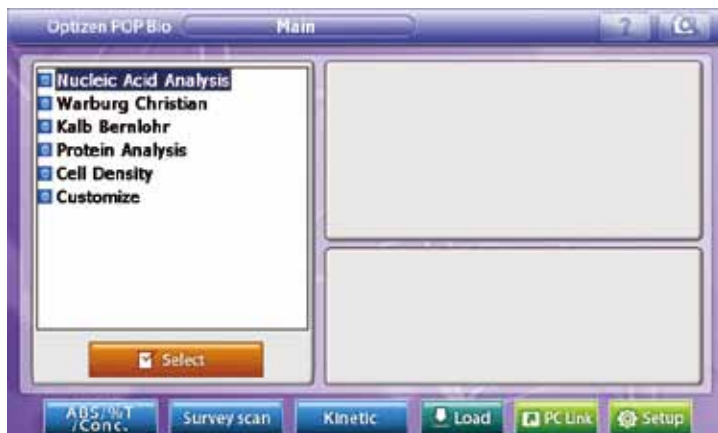
• Open file



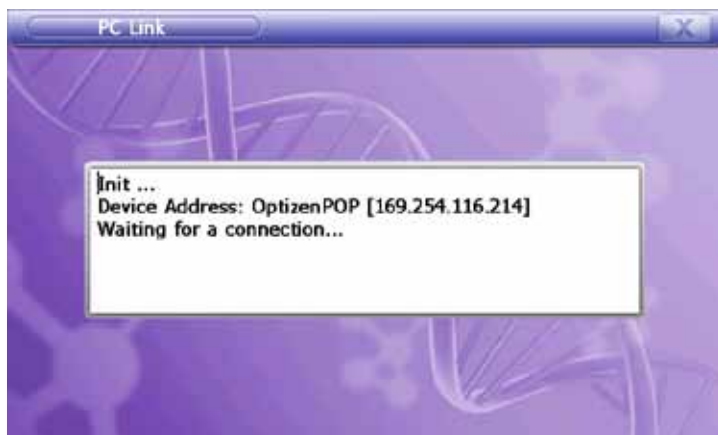
1. Select the storage device from    .
2. Select the folder.
3. Double click the file to open. Check the file name at **Name** .
4. Touch  to store.

13. PC link

1. Connect PC, IP router and OPTIZEN POP bio with lan cables.
2. Turn on Optizen POP bio. (Caution : Turn OPTIZEN POP bio on only after connecting OPTIZEN POP bio and IP router. And always check power of IP router with connection. Otherwise PC link cannot be operated.)
3. Touch  at the main screen.




4. Check display while connecting PC and Optizen POP bio.



5. Execute OptizenView 4.2 at PC.
6. Open config>options.

7. In Optizen View 4.2, set up device address as appeared IP address of Optizen POP bio.
(Input IP address, then Enter to apply PC link)
8. Touch [Apply], and PC and OPTIZEN POP bio will be connected.
9. It is possible to use OptizenView 4.2 for operating OPTIZEN POP bio.


14. POP Set

Touch  at main screen to move to POP set mode.

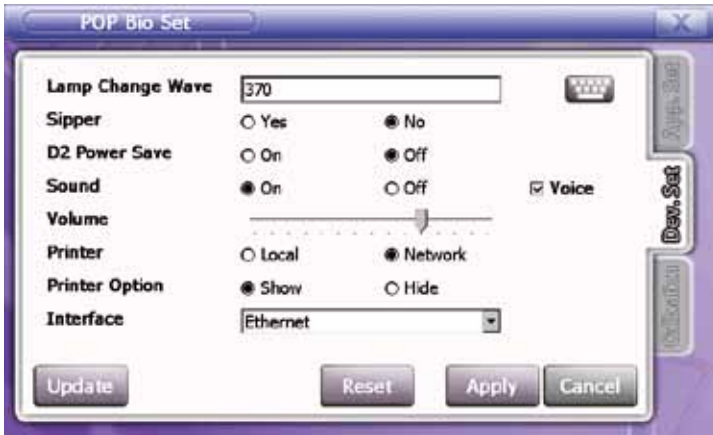
Manage application setting, device setting and calibration of OPTIZEN POP bio.

1) Application set



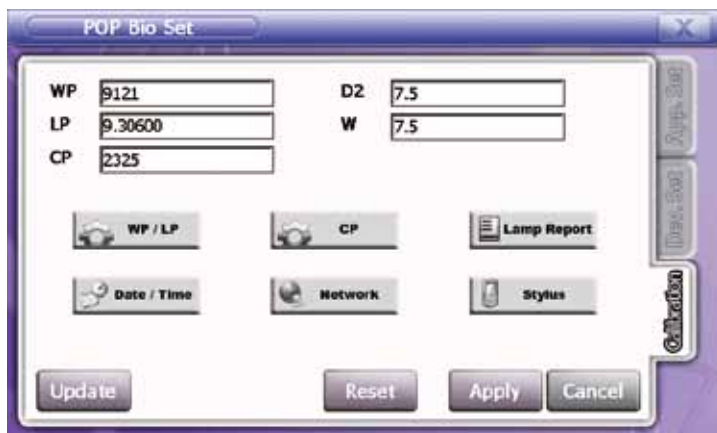
- **Initial Wave** : Set initial wavelength
- **Auto Zero** : select Auto Zero working type
 - Auto [B]** : POP will measure 'B' cell and set auto zero automatically.
You don't need to touch [Auto Zero] before measuring.
 - Manual** : You have to touch [Auto Zero] before measuring.
- **Language** : Select language
-  : Initialize application Set.




2) Device set




- **Lamp Change Wave** : Select wavelength point of lamp change. Select between 340~410nm
- **Sipper** : Use of sipper
 - **D2 Power Save** : Select D2 Lamp power save mode. Without necessity of UV range, check D2 power save 'ON' to extend the lifespan of D2 lamp.
(Caution: Frequent changes of ON/OFF saving mode may create diminution of D2 lamp's lifespan.)
- **Sound** : select voice guide and sound effect
- **Volume** : set volume
- **Printer** : direct connection/network connection
- **Printer Option** : select display of printer option tab. If you check 'hide', it will print without modifying of the print option.
- **Interface** : Select PC connecting method
- **Reset** : initialize Device Set

3) Calibration



- **WP** : Calibration Factor. 0th point of wavelength
- **LP** : Calibration Factor. Motor steps to move 1 nm of wavelength
- **CP** : Multi-cell Holder calibration factor. motor steps to move 1 cell holder at multi cell holder.
- **D2** : Used time of D2 lamp
- **W** : Used time of W lamp
-  : Start calibration of WP & LP
-  : Start calibration of CP
-  : Check and print used time of D2 & W lamps.



-  : Initialize calibration value. You must perform calibrating the equipment again after [Reset].

Part III . Technical Supports

1. Technical Supports

When you have any difficulties of using Optizen POP, Please go through and review with this user's guide. If troubleshooting does not help to solve troubles, please contact your nearest distributor or producer.

Caution: When contact for after service, must be reported symptom of trouble.

Mecasys Co., Ltd.

Postal code: 305-150

10F, 640-3 Bansuk dong, Yuseong-gu, Daejeon, Rep. of KOREA.

Fax : +82-42-485-7118

For technical service E-mail : maintenance@mecasys.co.kr

<http://english.mecasys.co.kr>



ISO 14001



ISO 9001



UV/VIS SPECTROPHOTOMETER
OPTIZEN POP



Better solutions
in Spectroscopic analysis
MECASYS

Head Office

10th Floor, 640-3, Banseok-dong, Yuseong-gu, Daejeon, 305-150,
Republic of Korea
Tel : +82-42-485-0118 Fax : +82-42-485-7118

Overseas Sales Department

8th Floor, Customer center of Hana Bank, 169-8, Samsung1-dong,
Kangnam-gu, Seoul, 135-882, Republic of Korea
Tel : +82-70-8244-0178, +82-10-5124-8118 Fax : +82-42-485-7118
e-mail : overseas@mecasys.co.kr, maintenance@mecasys.co.kr

DISTRIBUTOR'S INFORMATION