UV/Visible Spectrophotometer

Optizen Series User's Guide

For PC Interface software OptizenView 2005
March 2006 (1st edition)
Mecasys Co., Ltd.

Notice:

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://www.mecasys.co.kr/

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Part IV
QUICK GUIDELINE

Part I. Introduction & General Information

Chapter 1. Introduction

1. Preface

Before starting

Thank you for purchasing our UV/Visible spectrophotometer Optizen 3220UV and Software OptizenView 2005.

Optizen 3220UV can be applied various fields from a simple examination like a water quality analysis to a complex examination like a bio-chemical analysis. Users can measure easier, faster, and more accurate by convenient interface and automatic function.

How to use manual

This manual includes guideline of system installation, and Optizen 3220UV operating.

The manual is composed of several chapters and parts, which are categorized upon the subjects; so that users can search necessary chapters and parts quickly.

Mecasys Co., Ltd continuously supports technically to update via mailing service, internet and email.

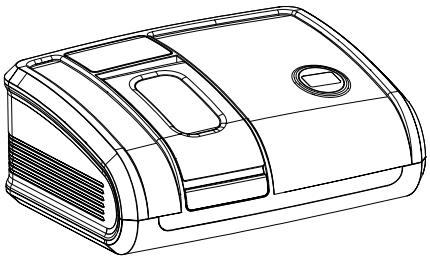
SYSTEMS

Specification

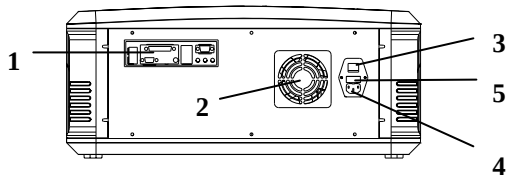
Photometric	Double beam optics
System spectral wavelength	< 1.0 nm
Range	190nm ~ 1100nm
Accuracy	<±0.3nm (at D2 lamp peak 656.1nm, and 486.0nm)
Reproducibility	<±0.1nm
Setting	0.1nm
Slew Rate	About 5000nm/min
Scanning speed	Maximum 3000nm/min
Photometric	
Range	-0.5 -4.0 absorbance
Accuracy	± 0.0004 ABS (at 1.0 ABS)
Reproducibility	± 0.0002 ABS (at 1.0 ABS)
Stray light	<0.05% T (at 220nm, 340nm)
Baseline stability	<±0.001nm ABS/h (at 550nm)
Baseline Flatness	<±0.001nm ABS (200nm ~ 1100nm)
Light Source	Tungsten- Halogen lamp and Deuterium lamp
Lamp Change	340nm ~410nm (default 370nm)
Wavelength	Including light automatic positioning system
Monochromator	Modified Czerny-turner type With 1200lines.mm blazed grating.
Detector	2 silicone photodiode
Dimensions	620 (W) X 480(L) X 300 (H)
Weight	16kg (After boxed: 17kg)
Power Requirement	AC 220V, 50/60Hz

CONSTRUCTIONS

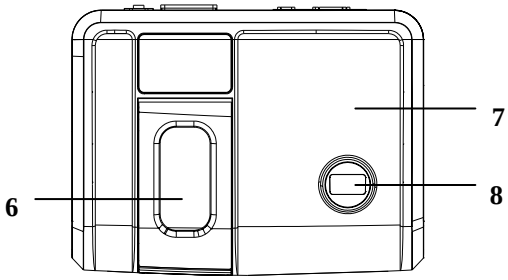
External construction



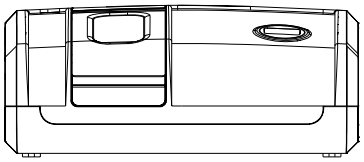
Rear Side



Top Side

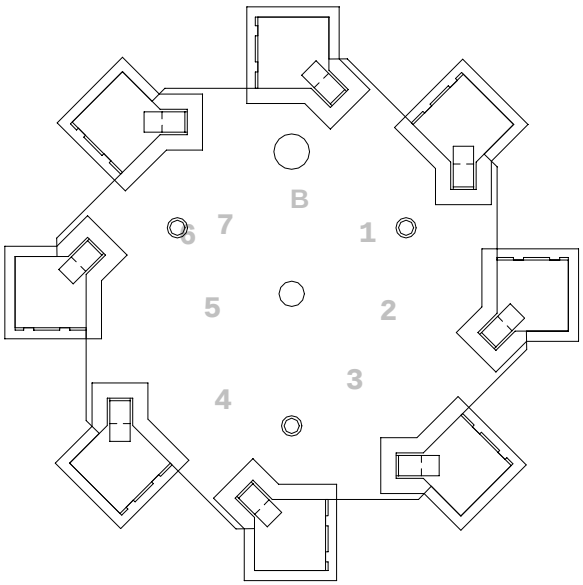


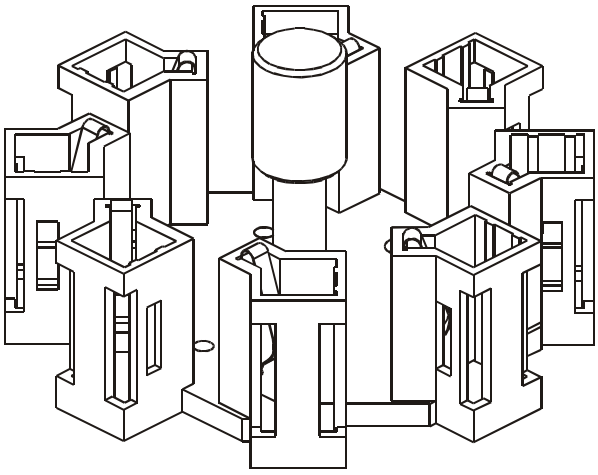
Front Side



1. Embedded personnel computer
2. Fan
3. Power switch : On/Off
4. AC power cable
5. Fuse
6. Sample compartment
7. Main Case
8. LCD

Cell holder





Chapter 2. Connecting with personnel computer

Stand alone version

Stand alone version is the way of using embedded computing system installed in Optizen 3220UV.

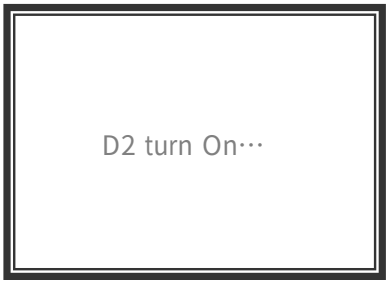
Connect mouse, keyboard, and monitor to rear side of Optizen3220UV, Optizen 3220UV is ready to use.

PC version

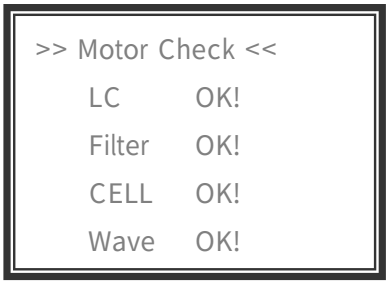
PC version is the way of connecting user's personnel computer with Optizen 3220UV.

Connect Optizen 3220UV and personnel computer by LAN cable (Cross cable) to start measuring.

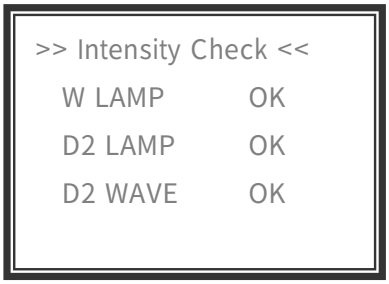
Chapter 3. When you start your Optizen 3220UV



Display when initializing Optizen 3220UV.



Every motor will run and shows its status.



Check and confirm status of lamps.
(D2 lamp and W lamp)

Ready to measure, all status has been automatically checked.

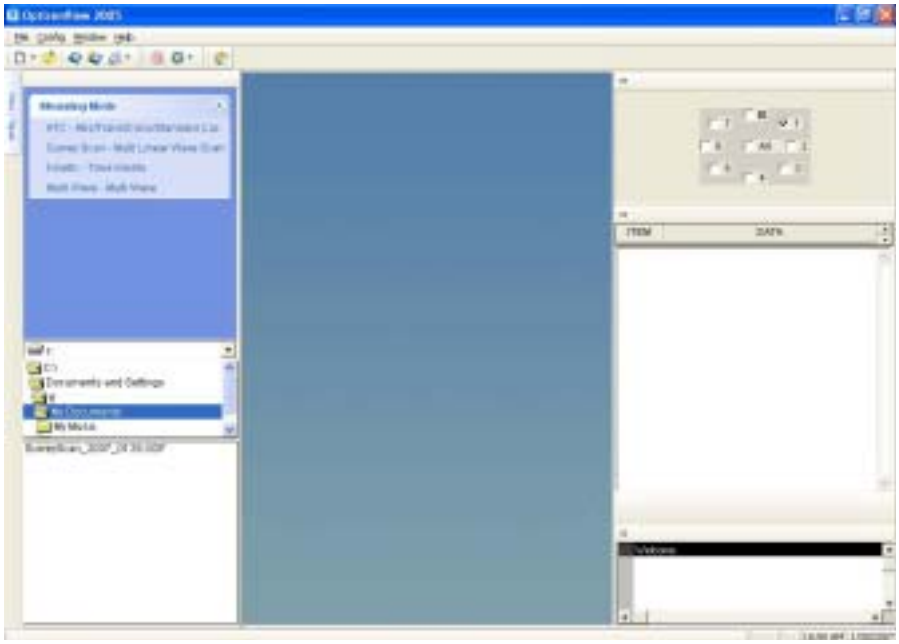
Chapter 4. When you start your Optizen 3220UV with stand alone version.

Introduction

Ready to measure with embedded computing system in Optizen 3220UV.

When you turn switch on Optizen 3220UV, embedded computing system is initialized at the same time.

Embedded computing system initializes as below. Optizenview2005 starting shows as below as well.



:Epitome

Specification of the embedded computing system.

. VIA C3 1.0 G
. Microsoft Window XP embedded SP2
. 40GB HDD
. 512MB DDR RAM
. VGA Display (1024 X 768)
. Printer (Option)
. Mouse, Keyboard,
. Monitor (or touch screen)

Chapter 5. Personnel computer version

Introduction

Personnel computer can be used with installing OptizenView 2005 into your personnel computer.

Before starting.

OptizenView2005 is designed and programmed software of PC interface for Optizen 3220UV. User can apply and administrate measuring results in real time under the required system such as Window-95/98/NT/2000.

Required system

OptizenView2005 can be installed with the required system as below.

. IBM PC Pentium or equivalent
. more than HDD 50MB
. over 64MB system memory
. Mouse and keyboard
. VGA display (1024 X 768)
. MS-Windows 95/98/NT/2000/XP
. Printer

Installation

Start “Setup.exe”

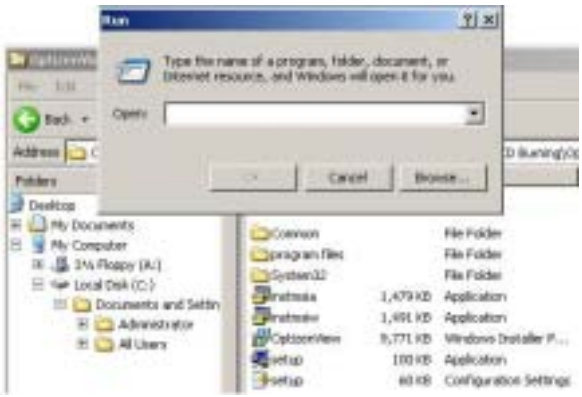
Check and confirm required system such as Windows, before installing OptizenView2005.

With Windows98 or Windows95, execute “setup.exe” as below “Install with Win9X”

With Windows2000/NT/XP, execute “setup.exe” as below “Install with Win2000”

Install with Win9X

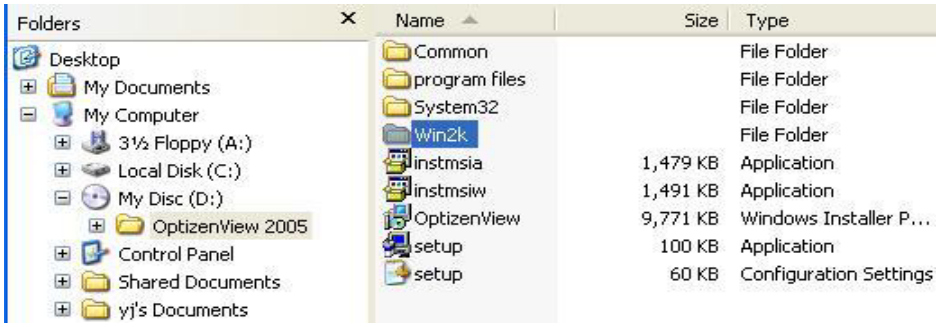
Select [START], then execute E:`setup.exe.
Or, Find setup.exe file from E drive, and execute.



(Caution) Above shows drive E, however, user must check CDROM drive.

Install with Win2000/NT/XP

1. Select [Start]
2. Find folder name WIN2K
3. Execute E:\setup.exe



(Caution) Above shows drive E, however, user must check CDROM drive.

Installation

Install with installationwizard

Process1.

OptizenView2005 start installation wizard.
When you like to stop installing, press [cancel].

Process2.

Star installation OptizenView2005.
When you like to stop installing, press [cancel].

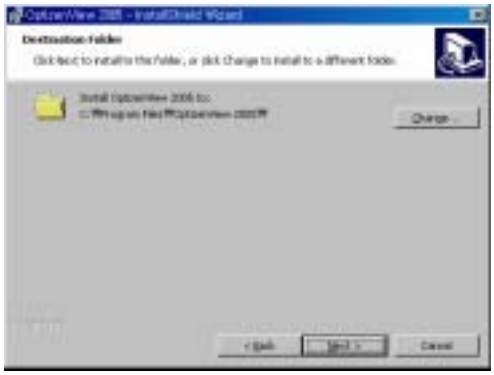
Process3.

All process for installation has been done.
Start installation program OptizenView2005 as below.

To continue installing program, press [NEXT]
When you like to stop installing, press [cancel].

Process 4.

Select folder for software OptizenView2005.



Choose folder for software Optizen View2005. For updating software for future reference and information, suggest saving files that has been served by installation wizard.

To save file that has been suggested folder, press [Next]. When you have other wishes to save file, press [Change].

Suggested folder
C:`Program files`OptizenView2005

Process 5.

Start processing installation.

OptizenView2005 is now on process of installation. According to specification of computer system, installation might take long.

Process 6,

Installation has been successfully completed.

All process of setup has been successfully completed, and new icon of OptizenView2005 shall be on your Display. Complete all the process of installation, click [Finish]

TROUBLESHOOTING (on process of installation)

On process of installation, you might encounter to reboot computer.

This incident of rebooting computer happens.

When this incident happens after process 2 or on process 5, proceed as below.

Case 1: After process 2

On process 2, ‘Restart’ message appears. Press [Confirm] to restart. After rebooting Windows, Process 3 starts automatically. According to the process 3, proceeds setup.

Case 2: On process 5,

On process 5, message box appears to restart as above. Click [Yes] to proceed ‘restart’.

After rebooting Windows, Process 5 will start continuously. When process alert to stop, click [Next] to precede setup.

Confirmation after installation

Check installation of OptizenView2005 correctly.
After installation, check existence of a directory as below has composed.

Search Directory C:`Program`OptizenView2005

Personal information (User information)

Start program, OptizenView will start with clicking as below.
START>PROGRAM>OPTIZENVIEW2005

Authentication box will appear when starts program OptizenView2005. Input Company name, User ID, Password, H/W key, and S/W key. S/W key is on Software CD.

Caution: S/W key shall not be lost to protect your right to get after services or updating software.

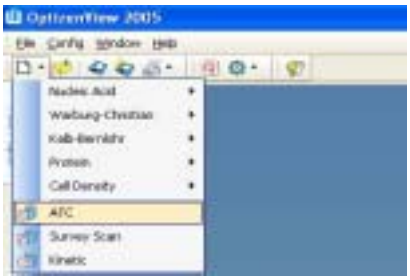
Part IV

Guideline and basic operation of OptizenView2005 and Optizen3220UV

Chapter 6. Guideline

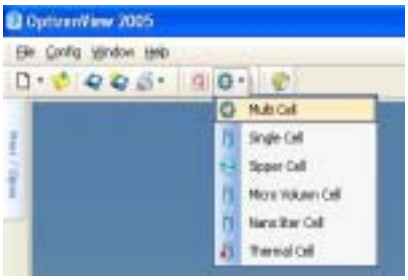
Tool box

New



Select measuring mode.

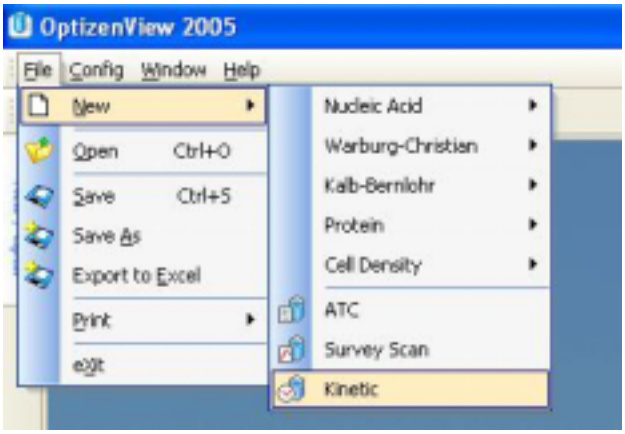
Cell holder



Select cell type.

File management

Making a new file (New file)



File[F]>New file[N]

Or select [New] in tool box.

Open file and Save (Save as)

Interface of File saving and opening mostly like designed operated same way as Windows.

File[F]>Open[O]

Or Select [open], [Save], [Save as] in tool box.

** Data files are save with *.ODF file.

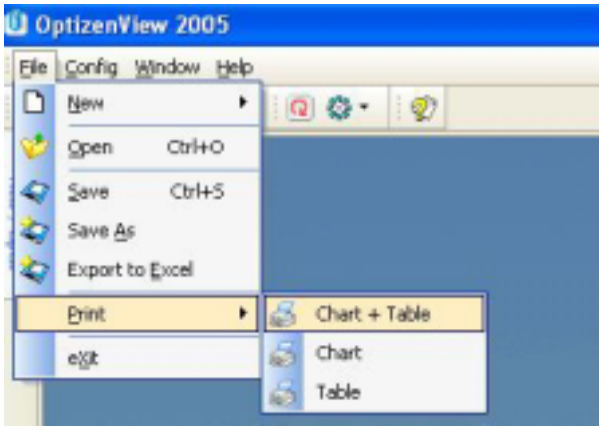
Save in Excel file [E]

Use save in Excel file[E] for saving file in MS-Excel file (*.xls)

Print[P]

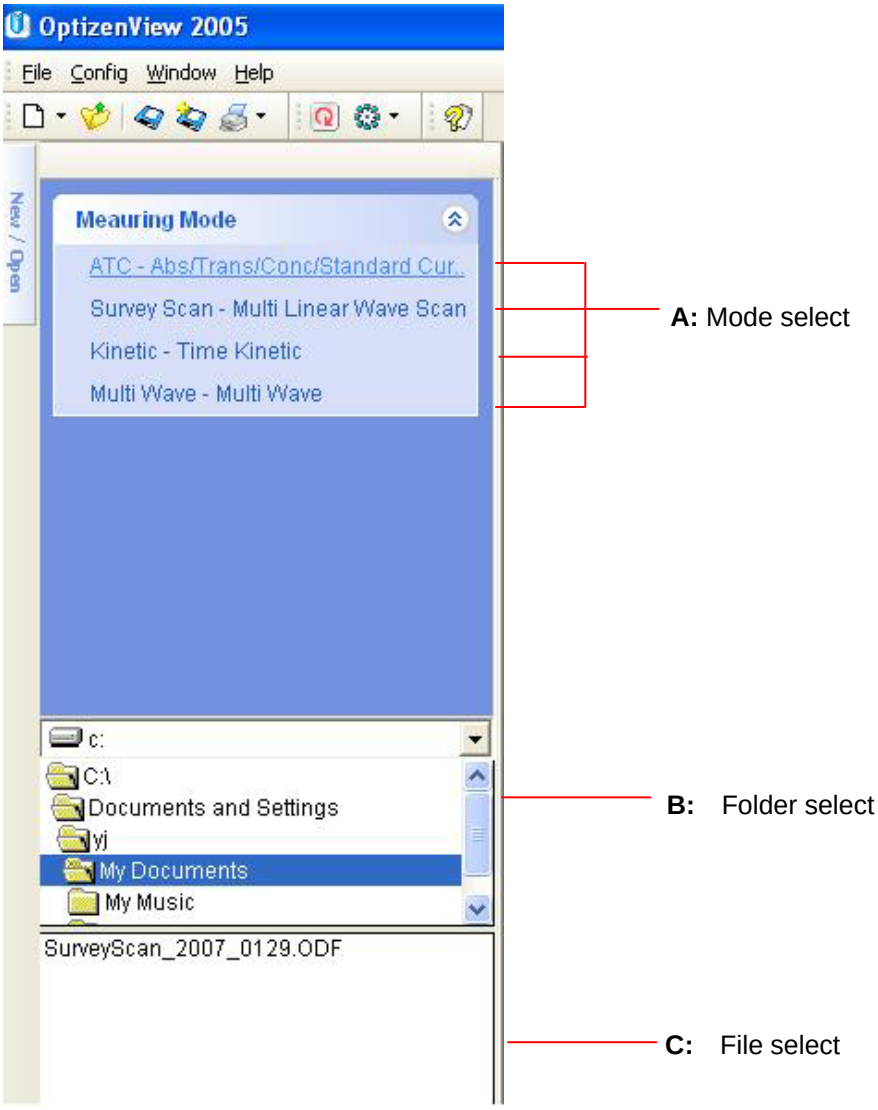
File [F]>Print[P]

[P] in tool box for printing out graph, and table for result of measurement.



Select Mode and file management

Move curser to left side of display of OptizenView2005 to see 'product shows', display will appear as below.



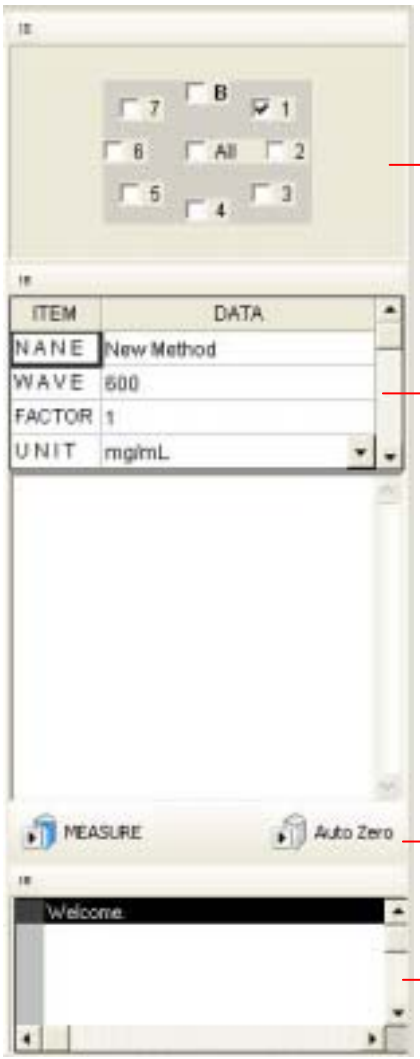
A: Select mode for measuring

B: Select folder for data.

C: Confirm the saved data, then double click will open file.

Common utilities, tool box, and message box.

On the right side of display of OptizenView2005, appears Cell selecting box, message box, and box of inputting name of data.



A: Select Cell

B: Input name of data and set measuring condition

C: Measure and AutoZero

D: Message box

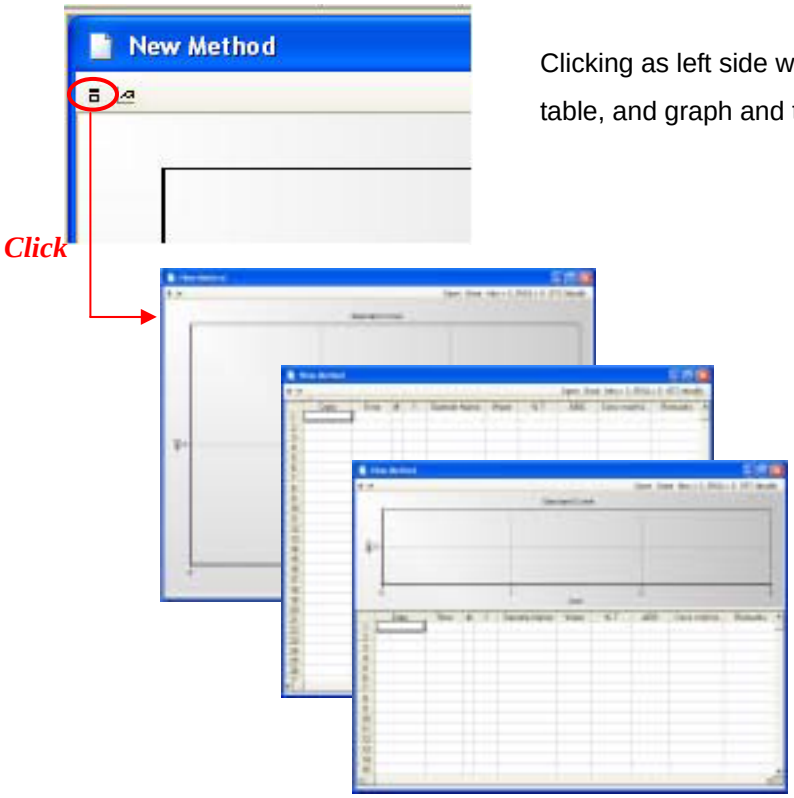
A: Select the number of cell for measuring

B: Input name of data and set measuring condition

C: Measuring AutoZero

D: Status of measuring, or error message.

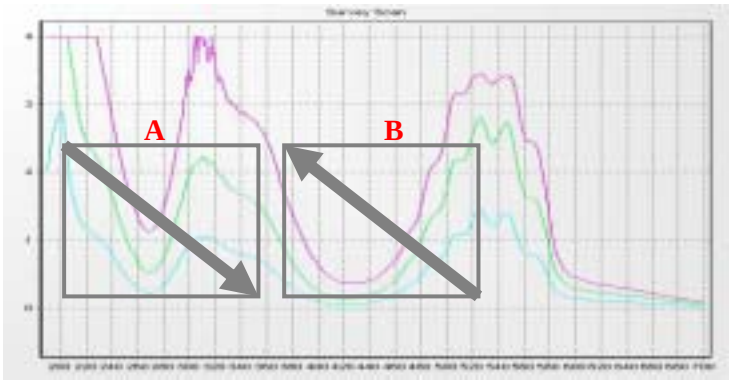
How to see display



Clicking as left side will show graph, table, and graph and table.

Graph Control

Zoom In/Out



Use drag and drop will lead display bigger and smaller window.

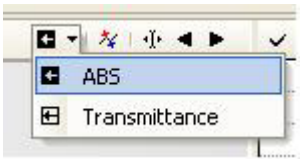
Drag and drop like ‘A’ in picture above, zoom out.
Drag and drop like ‘B’ in picture above, zooms in.

Move

Moving graph

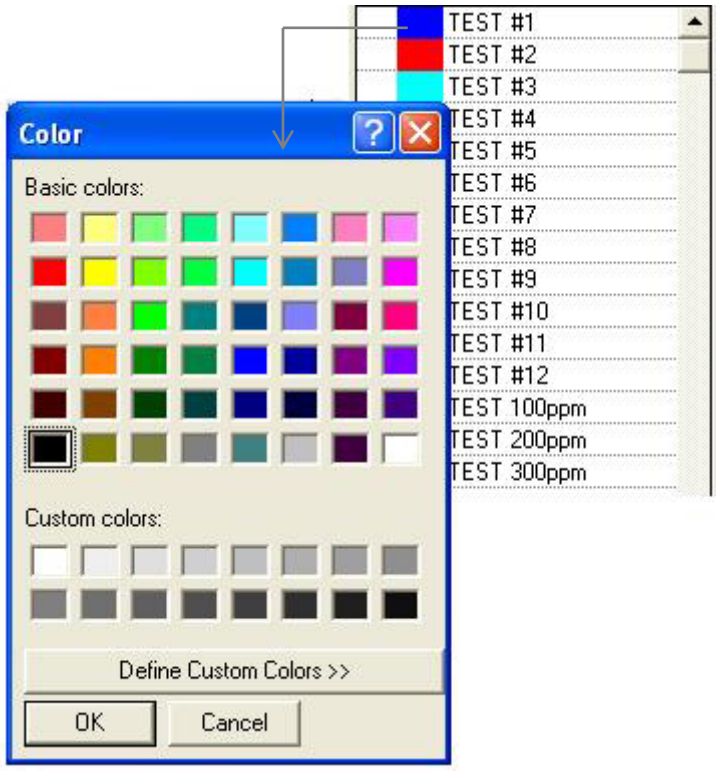
Click and move graph.

Select



Select absorbance or transmittance to show in Y axis of graph.
By selecting, transform into either way for showing absorbance or transmittance.

Set color of graph



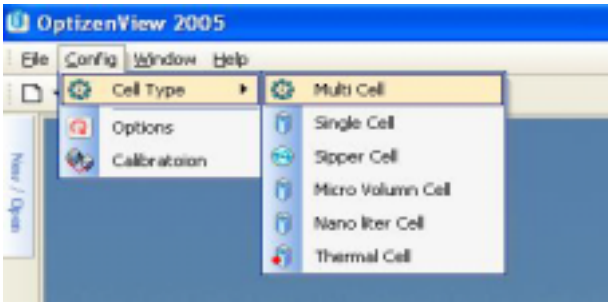
Choose color of line figment in graph from color box as below.

Chapter 7 Configuration

Before measuring for accumulating data, check conditions as shown below.

Select cell type

Select configuration[C]- [select cell type] in menu bar, cell type holder will shows as below. Select cell holder type, then status of changes in cell holder type will appear as below.



Multi cell holder

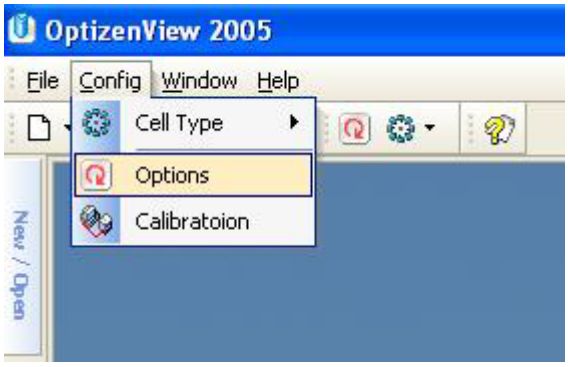
Standard cell holder
(8 rotating cell holder) shows as left
Configuration[C]-[select cell type]-[multi cell]

Single cell holder

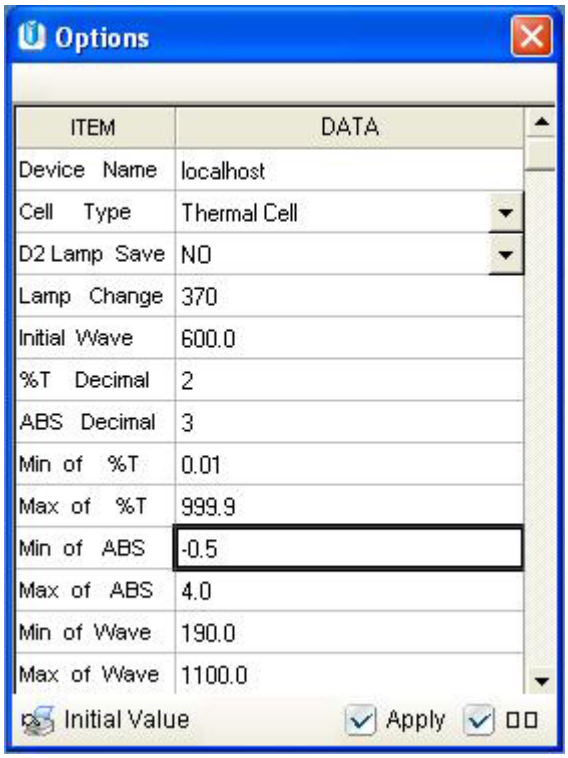
Standard setting Applied cell holders Round cell holder Film cell holder Long path cell holder Micro volume cell holder Single cell holder shows as left Configuration[C]-[select cell type]-[single cell]

Standard setting for conditions of measurement

Configuration[C]-[standard setting]



Select as above, table box appears as below.



Name of device

In a case of Stand Alone Version, Write or select "**Localhost**"

In a case of PC Version, when user has personal computer connected for measuring with Optizen 3220UV, write [Default: **Optizen3220UV**]

Type of Cell

Select multi cell or single cell accordingly.

Power saving [D2 Lamp]

When usage of visible light source area, user can save power and lengthened lifespan of D2 lamp by turning off D2 lamp. However, frequent switching power of D2 lamp might cause shortening lifespan of D2 lamp.

Caution: D2 lamp is one of expensive part in your instrument.

Lamp Change

Confirmation in wavelength range between 340nm and 410nm. User can set wavelength change point in D2 lamp and W lamp.

Select decimal of value transmittance [absorbance]

Set minimum/maximum decimal point in absorbance and transmittance.

Select maximum and minimum in transmittance and absorbance

Set minimum/maximum of measured value in absorbance and transmittance.

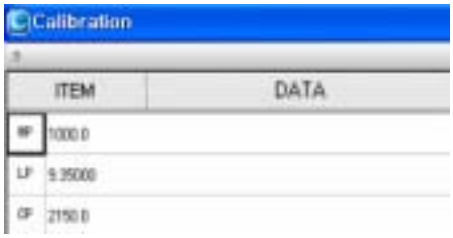
Set minimum/maximum of wavelength

Select minimum/maximum wavelength range.

However, wavelength range must stay in between 190nm and 1100nm..

Calibration [tool setting]

To calibrate Optizen3220UV, select **[Configuration[C]]-[Calibration]**.



Calibrate wavelength and cell holder positioning.

After manufacturing, on process of quality control, Mecasys has done all calibration for correction in wavelength and cell positioning. User must aware of calibration menu that is usually done under manufacturer's strict guideline.

This menu is only used for calibrating instrument only.

Caution: False calibration by user may cause breakdown.

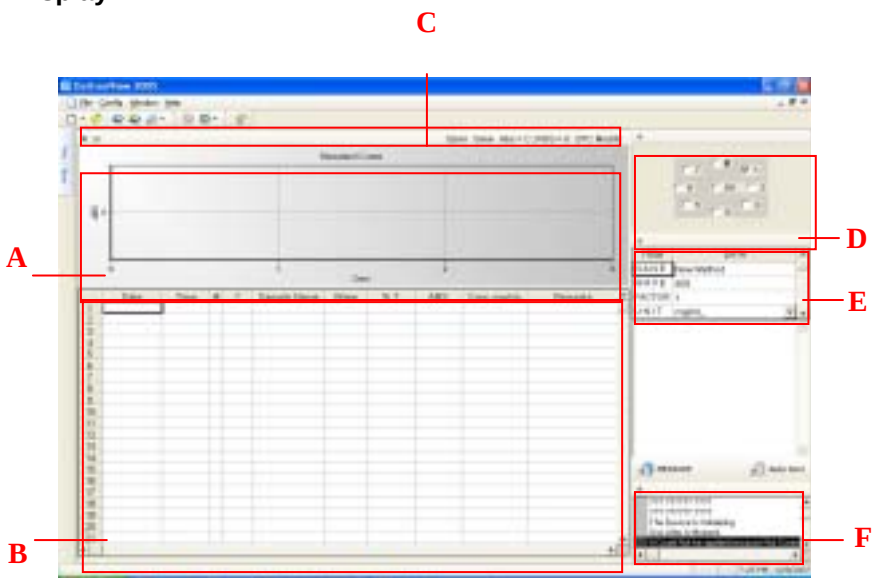
Chapter 8. Measuring mode

ABS/%T/CONC and Standard Curve

Introduction

Create standard curve in selected wavelength. Measure and display sample's absorbance , transmittance, and concentration.

Display



Measure

1) Select cell number [D].
2) Input box **[E]** shown as above:

Name of test

Wavelength

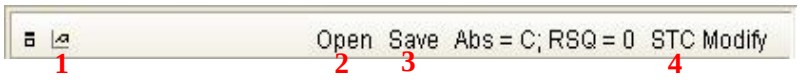
Distillation rate

Unit

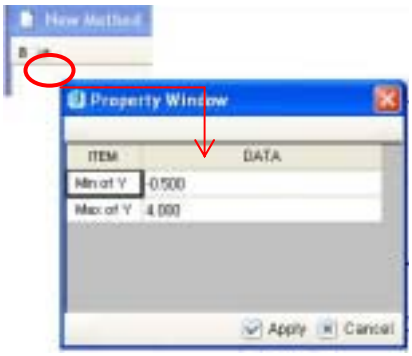
When taking concentration by Standard Curve, Click and select standard curve frame [C].

3) Click **Auto Zero[F] and execute.**
4) Click **Measure[F]**, display measured data in table **[B].**

Set graph up and standard curve file management [C]



Y axis Min/Max - 1



Set minimum/maximum value in y-axis of standard curve.

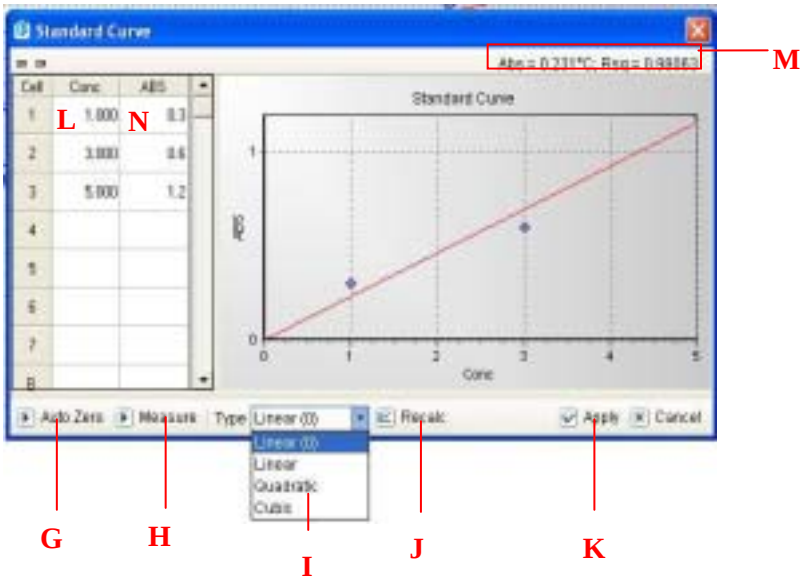
Standard Curve Open file/save – 2, 3

General interface as Windows, “open” and “save.”

*Standard file are generally saved as *.OSF dilation.*

Standard Curve - 4

Click [M] on right-upper ATC mode graph box, display will change to be as below for showing standard curve. When double click graph box, shown as below as well.



To create standard curve,

1) Input sample's concentration orderly from number 1. Maximum sample is 8 cells as multi-cell holder allows.
2) Click **Auto Zero[G],** click **Measure [H]** to start measurement. When tests are done, data result will appear as graph.
3) Select **equation[I]**, click **STC frame [J]** will show curve according to selected equation.
   [M] will show standard curve equation and Rsp value.

   Standard curve equation: ABS = a x C

   When ABS=absorbance and C=concentration,
   Better to have Rsq value close to 1.0.
4) Click **application [K]** to use framed graph into ATC **mode[A]**.

Manual Input & Edit (input measured data that user already have and frame standard curve)

Without test, when user already has measured data [concentration, absorbance], user can frame standard curve or fix standard curve that was already made.

Manual Input

Input **concentration [L]** and **absorbance [N]**: Maximum number of data : 50

Click **equation [I],** click **standard curve frame [J]**.

Curve Edit

Modify **absorbance [L]** value in measured standard curve.

Select **equation[I],** then click **standard curve frame [J]**.

Equation of A Regression line

Compensate maximum value of aberration and compute accurate value, an equation known as **Pearson'R equation** used when a linear line going through Zero point. And other linear line takes **method of ordinary least square**.

Pearson' R

$$r = \frac{n(\Sigma XY) - (\Sigma X)(\Sigma Y)}{\sqrt{\left[n\Sigma X^2 - (\Sigma X)^2\right]\left[n\Sigma Y^2 - (\Sigma Y)^2\right]}}$$

When,

X = Concentration

Y = Absorbance

Method of Ordinary Least Square

$$r^2 = \frac{\sum(\hat{Y}_i - \overline{Y})^2}{\sum(Y_i - \overline{Y})^2}$$

When,

$\hat{Y}$ = Extended coefficient in slope of Selection Curve.

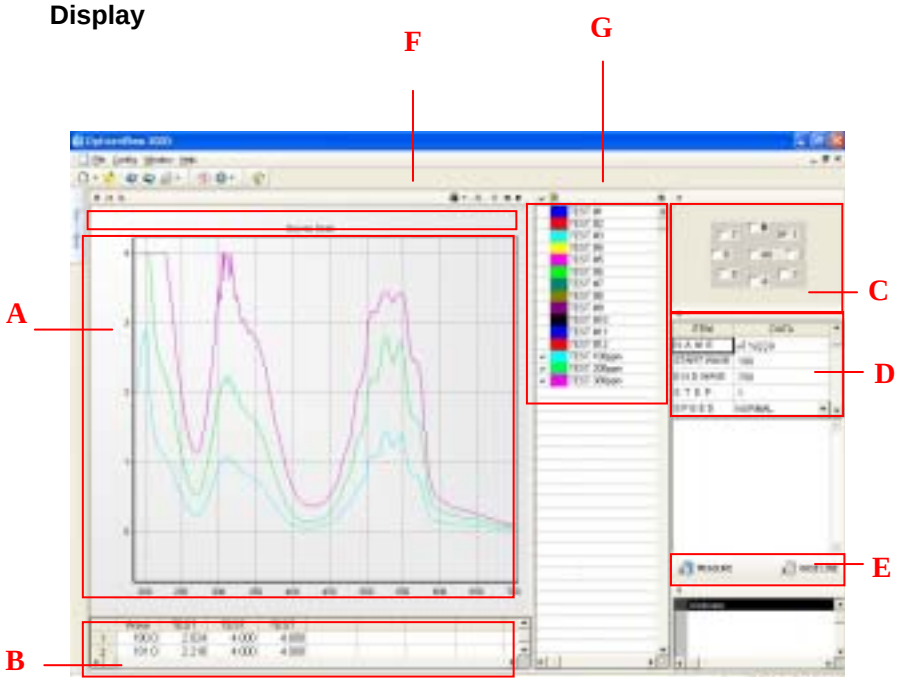
$\overline{Y}$ = Average

Survey Scan

Introduction

Survey scan allows user to have data with selected cell measured in selected wavelength range. After tested and measured absorbance and transmittance, test results will be shown as below table and graph.

Display



Test and measure

1) Select **Cell number** **[C]** to measure.
2) Input box **[D]** shown as above**:**

Start point of wavelength

Finish point of wavelength

Wavelength interval

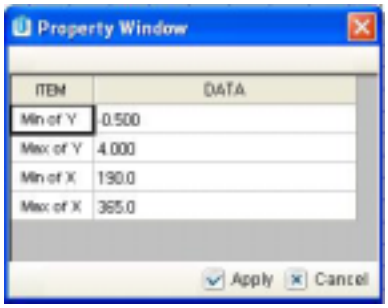
Scanning speed.

3) First, blank must be scanned with selected condition as order 2).
   Click **Baseline [E]** for setting up for blank.
   After setting up with blank, all cleared to measure.
4) Click **Measure [E]**.
   Tested data results will be shown as graph**[A]** and table**[B].**

Set graph [F]

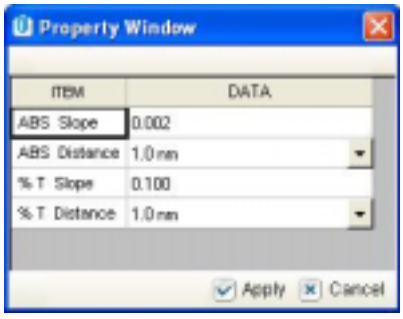
1 2 3 4 5 6

Set Range – 1



Set minimum/maximum wavelength (y-axis) and absorbance or transmittance (x-axis).

Set Peak/Valley – 2



This set peak/valley allows finding peak/valley automatically from the data results...

absorbance / transmittance - 3

Select absorbance or transmittance.

Peak/Valley, Cursor – 4, 5, 6

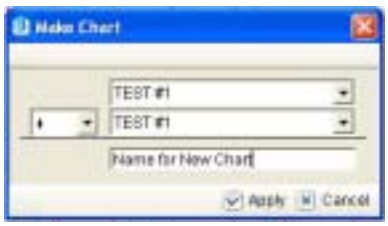
Click **Peak/Valley[4]** to find Peak/Valley.

In Peak/Valley box, click **Cursor[5]** will show absorbance (transmittance) and wavelength. <-/ -> table [6] arrows can search before or next peak/valley.

Managing tested results (data) [G]

Measured data **(G),** click right side of mouse will lead to be shown as left.

Manipulate



Choose two(2) test results to manipulate by **+, -, /, and *.**

Only display graph

Selected graph will appear in graph box **[A]**.

Title change

Change name of selected data.

Changing name of selected data will lead some changes in title of table.

Delete

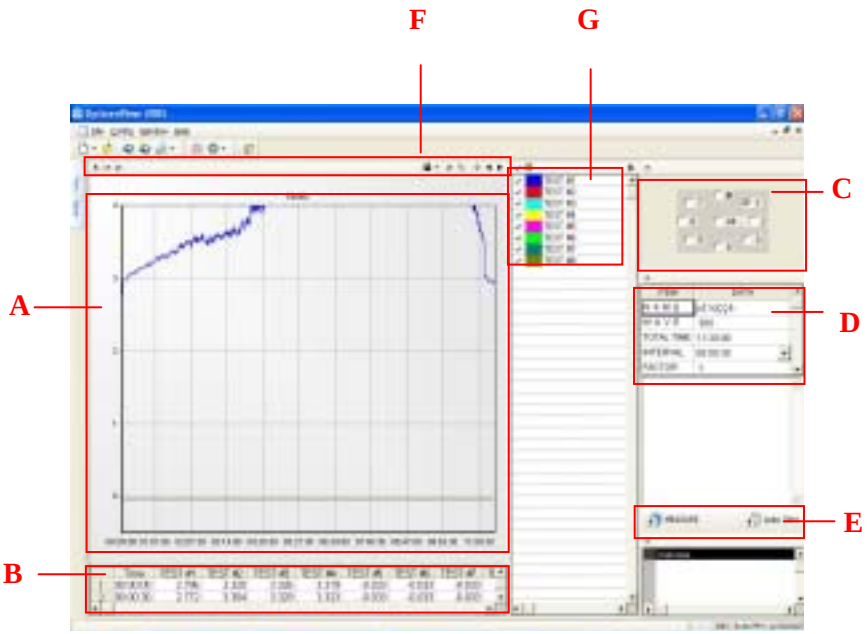
Delete selected data.

Simple Kinetic

Introduction

Simple kinetic allows mutation or variation of samples in time interval at selected wavelength. Test results will be shown as below table and graph.

Display



Test and measure

1) Select **Cell number [C].**
2) Input in a box **[D],**

Wavelength

Scanning time

Scanning interval in time

Factor

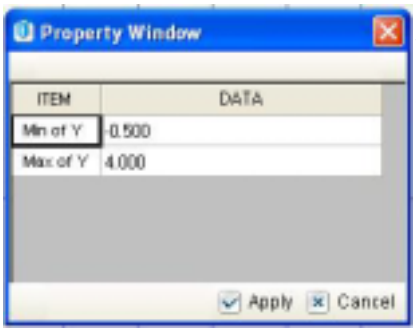
3) Click **Auto Zero[E]** to start**.**

Click **Auto Zero [E]** to start, and get tested results at the same moment. Results will be shown in graph**[A]** and table**[B].**

Frame and set a graph [F]

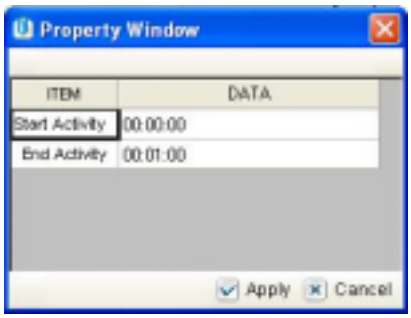
1 2 3 4 5 6

Set Range - 1



Y-axis shows transmittance or absorbance. Set Minimum and maximum.

Set Activity Range - 2



Set interval in time for activity.

absorbance / transmittance - 3

Select absorbance or transmittance.

 **Activity, Cursor – 4, 5, 6**

Click **Activity** will show interval in time and value will be shown on the right-upper part as a table.

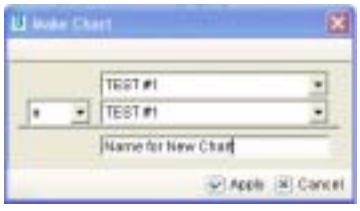
Click **Cursor [5]** leads displaying value of absorbance [transmittance], testing time, and testing wavelength.

<-/-> arrows **table[6]** leads before or next value in a table.

Managing measured data [G]

Measured data **(G),** click right side of mouse will lead to be shown as left.

Manipulate



Choose two(2) test results to manipulate by **+, -, /, and *.**

Only display graph

Selected graph will appear in graph box **[A]**.

Title change

Change name of selected data.

Changing name of selected data will lead some changes in title of table.

Delete

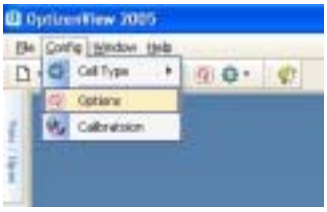
Delete selected data.

Chapter 9. Quick Guideline

Introduction

This chapter shows you measurement steps of each mode step by step to use OptizenView2005 more easily.

Confirmation before measurement



Click **Configuration (C)-[Tool Setting]** to check device name, type of cell, device information and other tool setting before measuring.

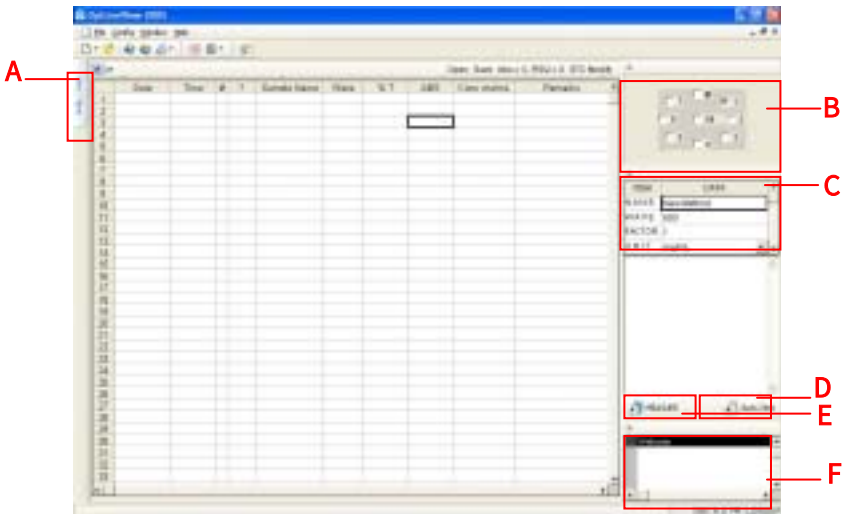
Set **device name,** select **Cell type**.
And set the display option and minimum/maximum of measured value (ABS/%T).

Ex) set device name

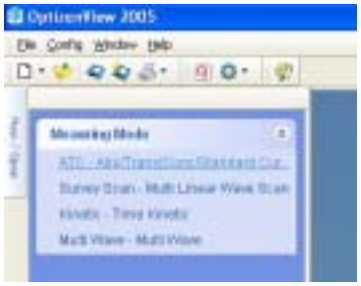
- Stand Alone Ver : **LOCALHOST**

Absorbance(Transmittance) Measurement

Display

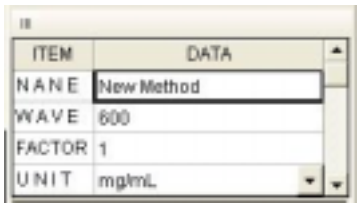


Measuring Guideline



Locate Mouse point **Mode Selection(A)** left side, and Mode selections will appear as shown left.

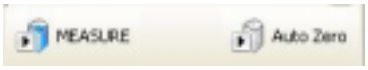
Double click **ATC**



Input name of test

wavelength

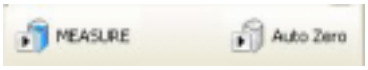
Distillation factor



Click **Auto Zero(D)** to correspond the light intensity between Sample & Blank.

While Auto Zero is executing, "**Executing Auto Zero**" appears on **Message Box(F)**, after execution

Select Cell Number(CELL 1-No. 1)(B).

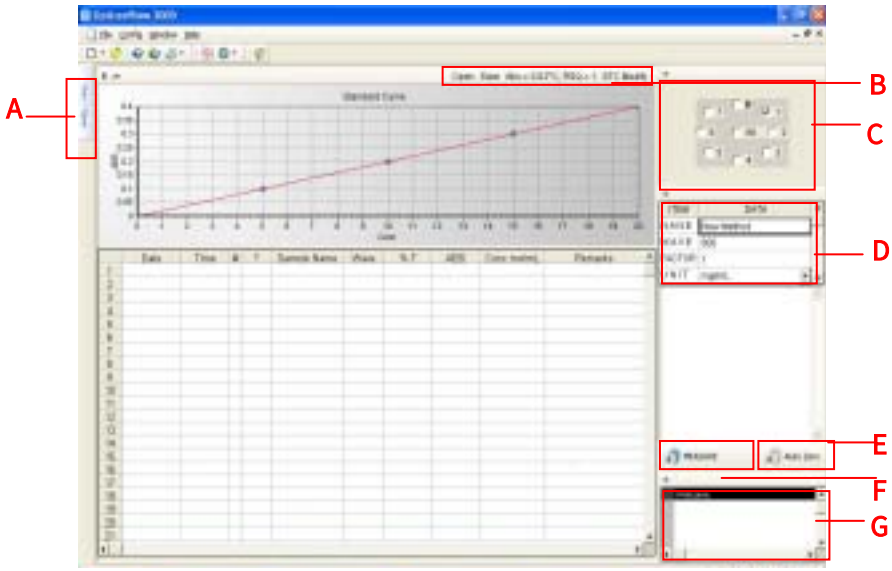


After Cell selection, Click **Measure(E)** to start measurement.

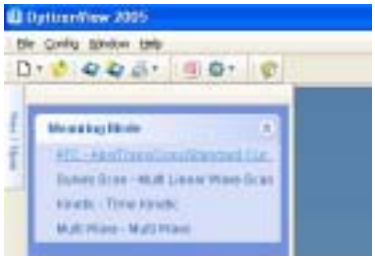
While execution, **"Measuring"** appears on **Message Box**, and after execution **"Ready"** appears.

Measuring Concentration using Standard Curve

Display

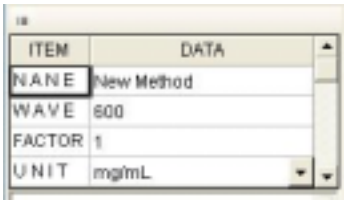


Measuring Guideline



Locate Mouse point **Mode Selection(A)** left side, and mode selections will appear as shown left.

Double click **ATC**

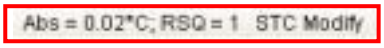


Input name of test

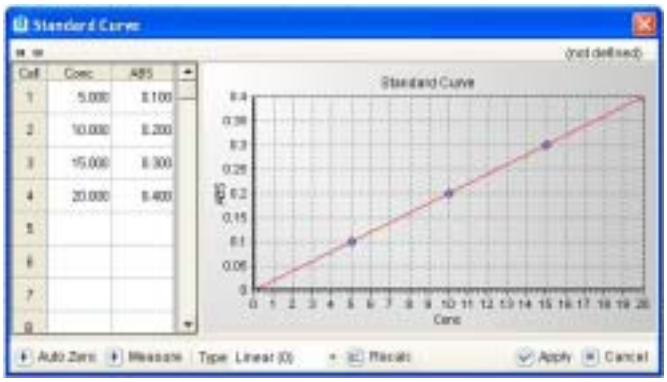
wavelength

Distillation factor

and unit.(D)



Pop up Standard Curve window **Double click Graph window** or **Click Make STC(B)** upper right side of graph**.**



To create Standard Curve

1. Input sample's concentration orderly from number 1**.(Cell number 1 – Number 1)**

2. Click **Auto Zero**.

3. Click **Measure** to start measurement.

Click **Auto Zero(E)** to correspond the light intensity between Sample & Blank.

While Auto Zero is executing, "**Executing Auto Zero**" appears on **Message Box(G)**, after execution

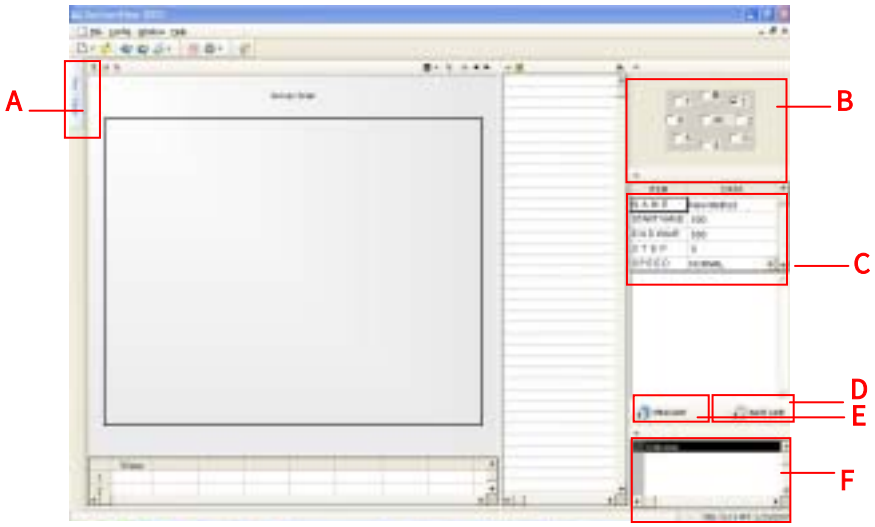
Select Cell Number(CELL 1-No. 1)(C).

After Cell selection, Click **Measure(F)** to start measurement.

While execution, **"Measuring"** appears on **Message Box(G)**, and after execution **"Ready"** appears on a

Measuring Absorbance(Transmittance) in Specific Wavelength area

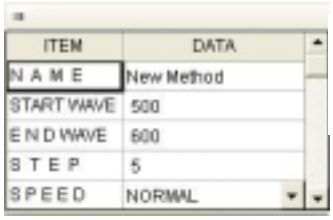
Display



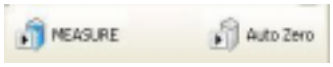
Measuring Guideline

Locate Mouse point **Mode Selection(A)** left side, and Modes will appear as left picture.

Double-click **SUR** .



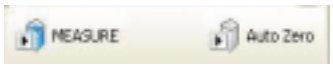
Input/select Name of Test, Start wavelength, finish point wavelength,



First and before measuring samples, click **BASE LINE(D)** for setting blank.

While execution, **"Executing Base Line Collection"** appears on **Message**

Select Cell Number(CELL 1-No. 1)(B).



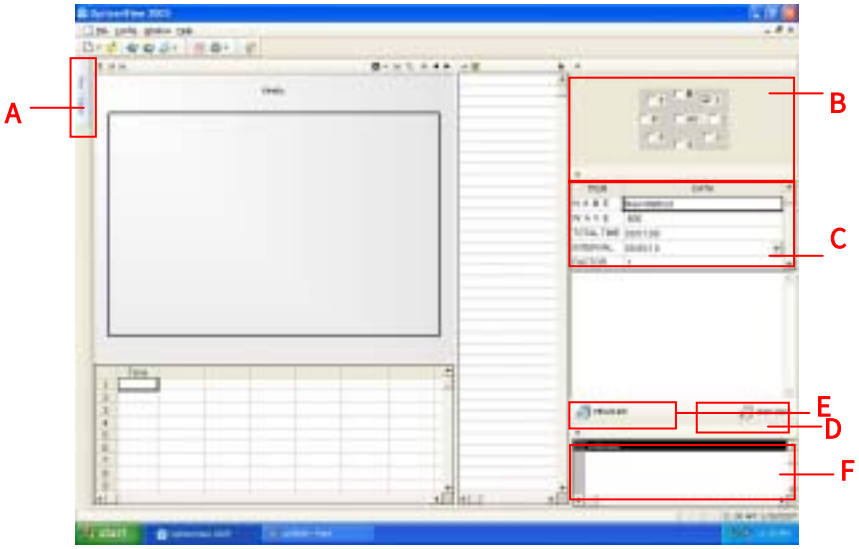
After selecting cell, click **Measure(E)** to start measurement.

While execution, **"Measuring"** appears on **Message Box(F)**, and after execution **"Ready"** appears on a

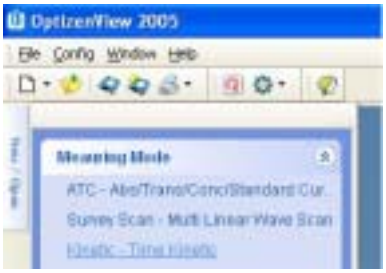
Measuring Absorbance(Transmittance) in Timely

:**Kinetic method**

Display

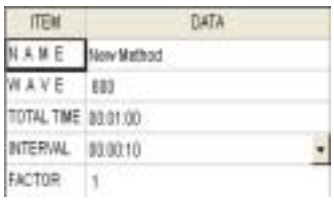


Measuring Guideline



Locate Mouse point **Mode Selection(A)** left side, and Modes will appear as left picture.

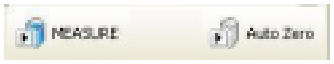
Double-click **KIN** .



Input Name of Test,

Wavelength,

Total Time

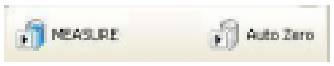


Click **Auto Zero(D)** to correspond the light intensity between Sample & Blank.

While Auto Zero is executing, "**Executing Auto Zero**" appears on **Message Box(F)**, after execution

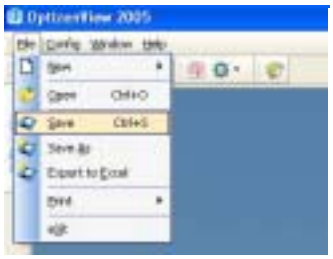
Select Cell Number(CELL 1-No. 1)(B).

After Cell selection, Click **Measure(E)** to start measurement.



While execution, **"Measuring"** appears on **Message Box(F)**, and after execution **"Ready"** appears on a message box and measured value will be displayed on a table and a graph.

Save and Print out after Measurement



Select **[File(F)]-[Save(S) or Save as(A)]** to save measured data.

*File format is *.ODF.*

Select **[File(F)]-[Save as Excel(E)]** to save measured data as Excel form.

Select **[File(F)]-[Print(P)]** and choose print form to print out.

Chapter 10. Troubleshooting

1. When a message box **[Instrument is not found]** appears,

Embedded PC(Internal PC) happens not to be operated in booting process of OPTIZEN 3220UV. Please re-boot 10 seconds later. After “beep” sound, rebooting has been succeeded.

- Check Device name at [setting].
- Stand Alone Version : **LOCALHOST**
- PC Version : **Optizen3220UV**

2. On process of installation

On process of installation, you might encounter to reboot computer.

This incident of rebooting computer happens.
When this incident happens after process 2 or on process 5, proceed as below.

Case 1: After process 2

On process 2, ‘Restart’ message appears. Press [Confirm] to restart. After rebooting Windows, Process 3 starts automatically. According to the process 3, proceeds setup.

Case 2: On process 5,

On process 5, message box appears to restart as above. Click [Yes] to proceed ‘restart’.

After rebooting Windows, Process 5 will start continuously. When process alert to stop, click [Next] to precede setup.

Part V. Technical Supports

Chapter 11. Technical Supports and After service

When user have difficulty of installing OptizenView2005 and OPTIZEN 3220UV or default of Optizen 3220UV. 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.

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