

# 2100 SERIES SPECTROPHOTOMETER SOFTWARE USER'S MANUAL

Version SB-2.10

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#### Introduction

The UNICO<sup>®</sup> Application Software--2100 has been designed to operate with UNICO<sup>®</sup> Spectrophotometer Model 2100 and 2100UV. The software runs on a PC (personal computer) with Windows<sup>®</sup> 98 operating system installed. It can also be used in PC with Windows<sup>®</sup> 95, Windows<sup>®</sup> NT, Windows<sup>®</sup> 2000 Professional, and Windows<sup>®</sup> XP.

Your UNICO<sup>®</sup> Application Software package includes:

- One CD containing the software (2100)
- Software User's Manual
- A 6 feet null modem connection cable with 9-pin and 25-pin female connector's on both ends.

The UNICO<sup>®</sup> Application Software performs the following methods for analysis:

Absorbance/%Transmittance/Concentration: measure the Absorbance, %Transmittance, Concentration/Standard, or Concentration/Factor at a single wavelength within the range of 325~1000 nm (Model 2100) or 200~1000 nm (Model 2100UV).

**Standard Curve**: create a calibration curve (choice of 4 curve fits) with up to 8 standard solutions at a single wavelength to determine concentrations of unknown samples.

**Kinetics** (Absorbance vs. Time Kinetics): measure a sample's absorbance change over a selected period of time, store the test results in data table, and display the results graphically.

#### **Minimum Computer Requirements**

To properly install and operate the enclosed software, it is required to have the following minimum computer configuration:

PC with:

- 16MB RAM
- Pentium or faster processor
- 10 MB of free space on memory
- VGA Color Monitor
- PS/2 mouse and keyboard

**NOTE:** The **UNICO<sup>®</sup>** Application Software provided will **NOT** function with a Macintosh/Apple or Linux computer.

#### **Software Installation**

#### Loading Software to Computer

To install the software, please close any open programs and disconnect from the Internet if online, then follow the instructions below.

- Step 1: Insert UNICO<sup>®</sup> Application Software CD into the CD drive of your PC. If the software can show the Automatic Setup Screen as Figure-1, go to Step 4. If it can not, go to Step 2.
- Step 2: Double click **My Computer** icon of your PC and locate the CD Drive as Figure-2 indicates.
- Step 3: Right click the CD Drive Label and click **Open** as shown in Figure-3
- Step 4: Click setup.exe as Figure-4 shown or click SETUP shown in Figure-1
- Step 5: The Setup Screen (Figure-5) will then display a "Welcome" message reminding you to close any open programs. If all programs are closed, then click OK and go to Step 6. If other programs are open and operating, click Exit Setup, close the open programs and return to Step 2.
- Step 6: Choose the Directory and Program Group where you want the software to be installed as shown in Figure-6 and Figure-7. The File Setup Directory 1 (Figure-6) will then appear. If the File Path selection is OK, then go to Step 7.

**NOTE**: if you wish to change the location of the installation, then click **Change Directory** and specify the desired directory. If you are unsure and need to examine your computer files, click on **Exit Setup** and go to Windows<sup>®</sup> Explorer to make sure no duplication or improper storage of the files will occur.

Setp 7: Click the **Install** Icon (Figure-8) to start **2100** installation, click **Continue** to finish the installation.

Step 8: Wait for the message stating the software was installed successfully as shown in Figure-9. Click **OK**, re-start your PC.

Congratulations! You have now installed your **UNICO<sup>®</sup> Application Software 2100** in your PC for your Model **2100/2100UV** Spectrophotometer.

		ware Installer
		•
SETUP	BROWSE	EXIT
United Products & Ins 182-E Ridge Road Da		PH: 732-274-1155 FX: 732-274-1151

Figure-1 Automatic Setup Screen

💻 My Computer				
∫ <u>F</u> ile <u>E</u> dit <u>V</u> iew <u>G</u> o F <u>a</u> vorites	: <u>H</u> elp			<u> 1</u>
Back Forward Up	Cut Copy	Paste Undo Delete	e Properties View	
Address 🛄 My Computer		<u> </u>	<ul> <li>Links » Nortor</li> </ul>	n AntiVirus 🔚 👻
	Name	Туре	Total Size	Free Space
	🛃 3½ Floppy (A:)	3½ Inch Floppy Disk		
innin	🥽 Local disk (C:)	Local Disk	4.86GB	2.47GB
My Computer	🗊 (D:)	Local Disk	4.58GB	4.58GB
	💶 🥽 Local disk (E:)	Local Disk	3.84GB	1.52GB
	🥽 (F:)	Local Disk	3.84GB	2.86GB
2100&uv2100e (J:) CD-ROM Disc	🖃 Local disk (G:)	Local Disk	6.46GB	4.24GB
	(H:)	Local Disk	3.83GB	3.47GB
	😑 (l:)	Local Disk	9.75GB	5.31GB
Capacity: 11.2 MB	2100&uv2100e (J:)	CD-ROM Disc CD-ROM Disc	11.2MB	0 bytes
🔲 Used: 11.2 MB	Printers	System Folder		
Free: 0 bytes	🐼 Control Panel	System Folder		
	2 Dial-Up Networking	System Folder		
	Scheduled Tasks	System Folder		
	web Folders	System Folder		
		•		
	Free Space: 0 b	ytes, Capacity: 11.2MB	My Computer	

Figure-2 Locate CD Drive Screen

💻 My Computer				_ 🗆 ×
<u>File E</u> dit <u>V</u> iew <u>G</u> o F <u>a</u> vorites	<u>H</u> elp			<u> 1</u>
Back Forward Up	Cut Copy	□     □     ×       Paste     Undo     Delete	Properties Views	• S
Address 🛄 My Computer		•	Links 🎽 Norton	AntiVirus 归 👻
	Name	Туре	Total Size	Free Space
My Computer	🚽 3½ Floppy (A:) ॡ Local disk (C:) ॡ (D:)	3½ Inch Floppy Disk Local Disk Local Disk	4.86GB 4.58GB	2.47GB 4.58GB
riy computer	. 🧊 Local disk (E:)	Local Disk	3.84GB	1.52GB
2100&uv2100e (J:) CD-ROM Disc	<ul> <li>(F:)</li> <li>Local disk (G:)</li> <li>(H:)</li> <li>(I:)</li> </ul>	Local Disk Local Disk Local Disk Local Disk	3.84GB 6.46GB 3.83GB 9.75GB	2.86GB 4.24GB 3.47GB 5.31GB
Capacity: 11.2 MB	2100&uv2100e (J:) (K:) Printers	CD-BOM Disc Open Explore	11.2MB	0 bytes
Free: 0 bytes	Control Panel Dial-Up Networking	Eind PartitionMagic 7.0 AutoPlay		
	Seb Folders	Scan with Norton Anti⊻irus		
	c	Sharing Dj WinZip 🕨 🕨		
		Eject		
Open		Create <u>S</u> hortcut	-	1.

Figure-3 Open CD Drive

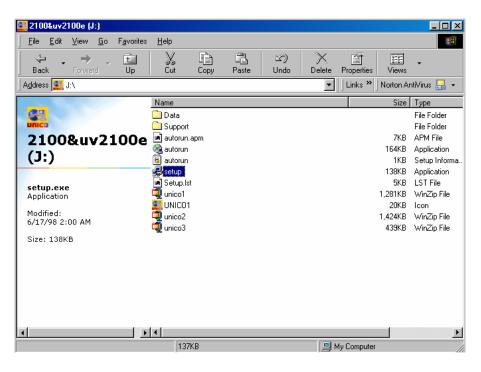


Figure-4 Click "setup.exe"

UNICO Setu	p	
	UNICO Setup	
	Setup cannot install system files or update shared files if they are in Before proceeding, we recommend that you close any applications be running.	n use. you may
	OK E <u>x</u> it Setup	

Figure-5 Set



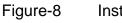
UNICO S	etup	
1	Begin the installation by clicking the button below.	
	Click this button to install UNICO software to the specified destination directory.	
	Directory: C:\Program Files\UNICO\	
	Egit Setup	

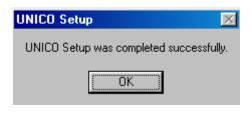
## Figure-6 File Setup Directory Selection I

🗐 UNICO - Choose Program Group	×
Setup will add items to the group shown in the Program Group box. You can enter a new group name or select one from the Existing Groups list.	
Program Group:	
E⊻isting Groups:	
PowerQuest BootMagic 7.0 PowerQuest PartitionMagic 7.0 Proton QuickBooks Pro QuickBooks Pro QuickTime Startup	
TRADOS S Freelance TRADOS S Freelance Applications UNICO	
<u>C</u> ontinue Cancel	

Figure-7 File Setup Directory Selection II









#### **Connecting Computer to Spectrophotometer**

Step 1: Remove the RS232 Connection Cable (double end) out of the bag.

Step 2: Locate the RS-232C port on the back of your PC. Connect the female 9-pin (small) connector (one end of the Connection Cable) to the male 9-pin of your PC and secure with the built-in screws. If your PC does not have a male 9-pin connection, use the male 25-pin connector.

**ONLY USE** The 25-pin connector if your PC does not have a male 9-pin connector (common for older, upgraded computers).

- Step 3: Model **2100/2100UV** Spectrophotometer has a male 9-pin RS-232C port on the back. Connect the other end of the RS232 connection cable to your Model **2100/2100UV** and secure tightly.
- Step 4: Turn on your PC (if not already on) and your Model **2100/2100UV** (if not already on, let it warm up for fifteen minutes).
- Step 5: Click the **Start** button on your PC, scroll to **Programs**, **UNICO**, and locate the **UNICO** (Figure-10), and click it.
- Step 6: The Start-up Screen of 2100 will appear as Figure-11 shown.



- Step 7: Click , a window will pop-up as Figure-12.
- Step 8: Press the ENT key on the Model 2100/2100UV panel, select the proper port in the pop-up window, and then click OK on your Computer Screen. The 2100 will initialize and go to the main screen (Figure-13).

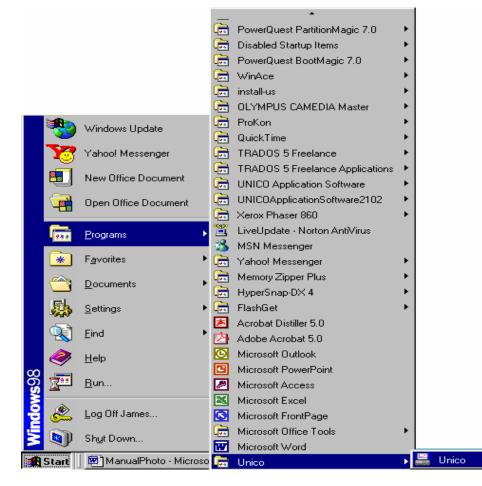
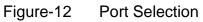






Figure-11 Start-up Screen





🔄 UNICO A/%T/C	
WAVELENGTH         DATA           546         Abs 0.000         %T 100.0	
DATA SCREEN	Application 🔒 😂 🎒 0A 0%T Exit
Sample Name:	
Operator: Filename:	WAVELENGTH SETUP:
Date: Time: 14:39:24	WAVELENGTH: 546 - Goto
WL:         546         Mode:         Abs           C/Std:         C/Factor:         Units:	
C/Std: C/Factor: Units:	TEST MODE SETUP:
	Abs
	C %Trans
	C Conc./Std
	C Conc./Factor
	MEASURING
	SAMPLE ID: 1 Test

Figure-13 Main Screen Display

CAUTION: The %T/0Abs Display Screen will display as Figure-14 shown. The buttons on the Operation Panel of 2100 and 2100 UV (Figure-15) are functionless.



Figure-14 **PC CONN** Screen

100.0	TRANSMITTANCE ABSORBANCE CONCENTRATION FACTOR	MODE
546	WAVELENGTH	
— <b>UNICO</b>	UV-21009	CONCENTRATION/FACTOR

Figure-15 **2100UV** Operation Panel

#### Main Screen Display

After your Model **2100/2100UV** is connected to your PC, and **2100** is running, your PC will show the **Main Screen Display** like Figure-13.

The **2100** Display Screen can be divided into three parts: **Data Screen** (Figure-14 Data Screen), **Test Status Display** (Figure-15 Test Status Display) and **Test Screen** (Figure-16 Test Screen).

#### Data Screen

Data Screen has two parts:

- Data Screen Display area
- Data Table

**Data Screen Display** area has ten Text Fields. You can input texts to four of them, which have **Sample Name**, **Operator**, **Filename**, and **Date** labels at their left. The Text Fields of **WL**, **Mode**, **C/Std**, **C/Factor**, and **Units**, which have

labels at their left, are set by **Test Screen** input. The **Time** Text Field is synchronized with the PC's clock.

DATA SCREEN
Sample Name:
Operator: Filename:
Date: Time: 09:50:22
WL: 546 Mode: Abs
C/Std: C/Factor: Units:

**Data Table** is the blank area under **Data Display Screen**. It records the text results automatically.

Figure-14 Data Screen

#### Test Status Display

It shows the current status of the 2100:

- Text Field under WAVELENGTH label shows the current wavelength of Model 2100/2100UV
- Text Field under **DATA** label shows the current data both in Absorbance and Transmittance
- Text Field under **SAMPLE** shows the position of the sample in the Cuvette Holder (it is the future function)
- Text Field under **LAMP** shows the UV and VIS lamp status

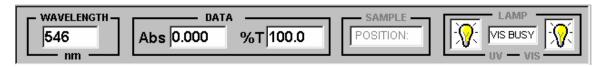


Figure-15 Test Status Display

#### Test Screen

It has ten buttons/icon buttons:

• Application button: select the three test methods: A/%T/Conc, Standard Curve, Kinetics (Figure-17 Test Methods)

- Save as icon button: save the setup or data displayed
- Load icon button: open any saved file (.tst)
- **Print** icon button: print all information shown in the **Data Screen** and any data collected
- 0A button: set 0 Absorbance and 100%T
- **0%T** button: set **0%T** (**0%T** black block required in the Cuvette Holder)
- Exit button: quit the **2100** and disconnect it from the spectrophotometer
- **GOTO** button: set the **2100**'s wavelength shown at its left. You can either clicking or typing the wavelength into the Test Field at the left of

clicking or typing the wavelength into the Test Field at the left of **Goto** button

- Enter button: select the test modes used: Abs, %Trans, Conc./Std, or Conc./Factor
- **Test** button: click to begin test and record the test results

You can enter Sample ID number—the numerical number from 1 to 999 or letter or both of them at the right of **SAMPLE ID** label after test mode is selected.

Application 🕞 🧭 🎒 0A 0%T Exit
WAVELENGTH SETUP:
WAVELENGTH: 546 Goto
TEST MODE SETUP:
Abs
C %Trans
C Conc./Std
C Conc./Factor
Enter
SAMPLE ID: 1 Test
Figure-16 Test Screen
Unico application
<ul> <li>A/%T/C</li> <li>STANDARD CURVE</li> </ul>
C KINETICS



Figure-17 Test Methods

#### **Basic Operation**

Three Analytical Methods--Absorbance/%Transmittance/Concentration, Standard Curve, and Absorbance vs. Time Kinetics are illustrated below.

Absorbance, %Transmittance, Concentration

#### The Absorbance, %Transmittance, Concentration

- > (A/%Trans/Conc) method has the following three modes of operation:
  - Absorbance/%Transmittance
  - Concentration/Standard
  - Concentration/Factor

#### Main Screen of A/%Trans/Conc

At the **Main Screen**, click **Application**, check **A/%T/C** (Figure-17), and click **OK** button to enter the **Main Screen of A/%T/C** (Figure-18). Type **Sample Name**, **Operator** (name), **Filename**, and **Date** into the appropriate text fields.

💐 UNICO A/%T/C	
WAVELENGTH         Data           546         Abs 0.000         %T 100.0	
DATA SCREEN Sample Name: Water Operator: <u>kathy</u> Filename: <u>Test1</u> Date: 05/09/2002 Time: 14:50:52 WL: 546 Mode: Abs C/Std: C/Factor: Units:	Application Restriction Restri

Figure-18 Main Screen of A/%T/C

#### > Absorbance/%Transmittance Mode

The following are the basic operation procedures.

- Step 1: Insert **reference** cuvette or nothing into the Sample Compartment and close the lid.
- Step 2: Select the desired **wavelength** by clicking button on the PC screen to set or typing in the desired **wavelength**, click **Goto** button at the right
  - of **\_\_\_\_** button to set the wavelength.
- Step 3: Click on **0A** button to **blank** the reference (Figure-19).
- Step 4: Select the test modes: **Abs** or **%Trans**, and press **Enter** button (Figure-20 Test Mode Selection)

- Step 5: You may type in Sample ID number at the right of **SAMPLE ID** label after test mode is selected. The ID number can be the numerical number from 1 to 999 or letter or both.
- Step 6: Remove the reference (if it is there) and place your sample cuvette into the Sample Compartment, close the lid and click on **TEST** Button. The test results will be displayed in a spreadsheet format in the **Data Table** at the **Data Screen**. Two sample test results are shown in Figure-21 and Figure-22.

💐 UNICO A/%T/C	
WAVELENGTH       546       nm         Data       %TBLANK	
DATA SCREEN	Application 📱 😂 🎒 0A 0%T Exit
Sample Name: Wated Operator: <u>kathy</u> Filename: Test1 Date: 05/09/2002 Time: 15:14:12	WAVELENGTH SETUP: WAVELENGTH: 546 Goto
WL:         546         Mode:         Abs           C/Std:         C/Factor:         Units:         Units:	TEST MODE SETUP:
	© Abs C %Trans C Conc₀Std
	C Conc./Factor
	MEASURING SAMPLE ID: 1 Test

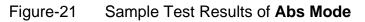
Figure-19

**0A** Blanking

🗠 UNICO A/%T/C	×
Bata     Bata       546     Abs       nm     %T	SAMPLE     LAMP       POSITION:     VIS BUSY       UV - VIS
DATA SCREEN Sample Name: Water Operator: kathy Filename: Test1 Date: 05/09/2002 Time: 15:14:56 WL: 546 Mode: Abs C/Std: C/Factor: Units: C/Factor: Now you can measur OK	onc./Std

≤, UNICO A/%T/C	_ [ ] ×
WAVELENGTH       546       nm         Abs       0.191       %T       64.5	
- DATA SCREEN Sample Name: Water	Application F 😂 🎒 0A 0%T Exit
Operator:         kathy         Filename:         Test1           Date:         05/05/2002         Time:         15:30:32           WL:         546         Mode:         Abs           C/Std:         C/Factor:         Units:	WAVELENGTH: 546 Goto
No.         ID         Abs.           1         001         0.111           2         002         0.152           3         003         0.164           4         004         0.191	Abs     Since Street     Abs     Since Street     Conc./Std     Conc./Factor     Enter
	MEASURING SAMPLE ID: 5 Test

Figure-20 Test Mode Selection



💐 UNICO A/%T/C			
546	Abs 0.191	%T <mark>64.4</mark>	SAMPLE - LAMP POSITION: VIS BUSY UV - VIS
-DATA SCREEN Sample Name: Wate Operator: kathy Date: 05/05/2002 WL: 545		e: [Test2	Application WAVELENGTH SETUP: WAVELENGTH: 546 Goto TEST MODE SETUP: C Abs C Onc./Std C Conc./Factor Enter
			SAMPLE ID: 5 Test

Figure-22 Sample Test Results of %Trans Mode

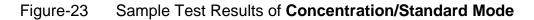
#### Concentration/Standard Mode

The purpose of this test is to determine the **Concentration** of the unknown samples by comparing the samples' **Absorbance/Transmittance** to that of the standard solution.

Repeat Step 1 to 3 in Absorbance/%Transmittance Mode section.

- Step 4A: Select the Test Mode: **Conc./Std**, type in the known concentration of the standard solution in the Text Field at the right of **Conc./Std** label, type in the unit in the Text Field at the right of the **UNITS** label.
- Step 5A: Place the standard in the Sample Compartment and close the lid.
- Step 6A: Click the **Enter** button. This will measure the **Absorbance** of the standard and set its conversion **Factor** for measuring the unknown samples.

💐 UNICO A/%T/C	
bata       546       nm         Data         Data         C	
- DATA SCREEN Sample Name: Water	Application 🕞 🍃 🎒 0A 0%T Exit
Operator: kathy Filename: Test3	WAVELENGTH SETUP:
Date:         05/09/2002         Time:         10:50:36           WL:         546         Mode:         Conc           C/Std:         100         C/Factor:         1408.45         Units:	WAVELENGTH: 546 Coto
No. ID Abs. Conc	TEST MODE SETUP:
1 001 0.099 139.437	CAbs
2 002 0.102 143.662	C %Trans
3 003 0.100 140.845	Conc./Std 100
	UNITS ppm Enter
	MEASURING SAMPLE ID: 4 Test



Step 7A: Place your sample(s) in the Sample Compartment and click the **TEST** button for each sample to be measured. **Absorbance** and the **Concentration** of the samples will be displayed in the **Data Table** (Figure-23).

#### Concentration/Factor Mode

The purpose of this test is to measure the **Concentration** of the samples with known multiplication factor to calculate the **Concentration**.

#### Repeat Step 1 to 3 in Absorbance/%Transmittance Mode section.

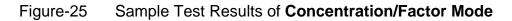
- Step 4B: Select the Test Mode: **Conc./Factor**, type in the desired **Factor** in the Text Field at the right of **Conc./Factor** label, type in the unit in the Text Field at the right of the **UNIT** label (Figure-24 Factor Setting).
- Step 5B: Place the samples into the Sample Compartment, close the lid, and click the **Enter** button.
- Step 6B: For each sample, be sure to place the sample in Sample Compartment and close the lid. Click the **TEST** Button to record results. The

**Absorbance** and **Concentration** of the samples will be displayed in the **Data Table** (Figure-25).

💐 UNICO A/%T/C	
WAVELENGTH     DATA       546     Abs 0.000     C 0	
DATA SCREEN           Sample Name:         Water           Operator:         kathy         Filename:         Test4           Date:         05/09/2002         Time:         16:10:59           WL:         546         Mode:         Conc           C/Std:         -0.002         C/Factor:         2         Units:	Application

Figure-24 Factor Setting

💐 UNICO /	A/%T/C				
		Abs 0.19	<u>рата</u> 00 С	0	
- DATA SCR	EEN				Application 🔚 😅 🎒 0A 0%T Exit
Sample N	lame: Wate	r			
Ope	rator: kathy		]Filename: [	Test4	WAVELENGTH SETUP:
Date: 0	5/09/2002	Time: 16	612:31		WAVELENGTH: 546 Goto
WL: 5	46	Mode: 🖸	onc		
C/Std: 🖸		C/Factor: 2.	000 U	nits: ppm	TEST MODE SETUP:
No.	ID	Abs.	Conc		CAbs
1	001	0.076	0.152		C %Trans
2	002	0.149	0.298		C Conc./Std
3	003	0.163	0.326		© Conc./Factor 2.000
	004	0.130	0.500		UNITS ppm Enter
					MEASURING
					SAMPLE ID: 5 Test



#### Standard Curve

The Standard Curve (Calibration Curve) method allows the operator to

- Measure up to 8 standards
- Calculate standard curves with 4 curve fits, including:

- 1. Linear Thru Zero: set the y-intercept equal to zero; therefore, the curve is forced through zero. Calculate and display the slope and Correlation Coefficient.
- 2. **Linear Squares**: Linear regression model. Calculate and display the slope, y-intercept, and **Correlation Coefficient** for the given standards.
- 3. 2<sup>nd</sup> Order: second derivative of the Linear Squares model. Calculate and display the coefficients. This method is used for non-linear standard curves or curves with a Correlation Coefficient of less than 0.9.
- 4. **Segmented**: straight line. Use the standards as nodes to connect each point. No data is displayed or calculated.
- Select and view existing standard curves
- Calculate the **Concentrations** of unknown samples

#### Main Screen of Standard Curve

At the **Main Screen**, click **Application**, check **Standard Curve** (Figure-17), and click **OK** button to enter the **Main Screen of Standard Curve** (Figure-26). Type **Sample Name**, **Operator** (name), **Filename**, and **Date** into the appropriate text fields.

💐 UNICO Standard Curve	
WAVELENGTH     DATA       546     Abs 0.000       nm	
DATA SCREEN Sample Name: Water Operator: kathy Filename: Test5 Date: 05/09/2002 Time: 14:16:58 WL: 546 Mode: Åbs Slope: Intercept Units:	Application Review VIS WAVELENGTH SETUP: WAVELENGTH: 546 Goto STANDARD SETUP: SAMPLES: 8 UNITS: C/std Abs C/std Abs Draw
	MEASURING SAMPLE ID: 1 Test



💐 UNICO S	tandard Cur	ve			
		Abs 0.000	data D %T 1	00.0	SAMPLE         LAMP           POSITION:         VIS BUSY           UV         VIS
-DATA SCR	EEN				Application F 🚰 🎒 0A 0%T Exit
Sample N	ame: Water				
Ope	rator: kathy		ename: Test5		WAVELENGTH SETUP:
Date: 05/0 WL: 546		Time: 16:38: Mode: <sup>Abs</sup>	42		WAVELENGTH: 546 + Goto
Slope: 0.95		ercept: 0.000	Units:	ppm	STANDARD SETUP:
No.	ID	Abs.	Conc		SAMPLES: 4 - UNITS: ppm
1	001	0.236	0.266		
2	002	0.158	0.164		C/std Abs
4	003	0.236	0.266		0.09 0.101 0.15 0.149
		0.100	0.001		0.18 0.163 0.20 0.190
					Draw
					SAMPLE ID: 5 Test

Figure-27 Sample Test Results of Standard Curve

The following are the basic operation procedures.

- Step 1: Insert **reference** cuvette or nothing into the Sample Compartment and close the lid.
- Step 2: Select the desired **wavelength** by clicking button on the PC screen to set or typing in the desired **wavelength**, click **Goto** button at the right of button to set the wavelength.
- Step 3: Click on **0A** button to **blank** the reference.
- Step 4: Under **Standard Setup**, at the right of **SAMPLES** label, click button and set the number of standards (from 2 to 8) to be used.
- Step 5: Type the units to be displayed at the text field of **UNITS** label.
- Step 6: Place the standards in the Sample Compartment in order of lowest concentration to highest concentration. Type the concentration of the standards (e.g. 0.09 here) into the Text Field starting below C/Std label. Press Enter key on your computer keyboard or click with the mouse to move to the next cell. Repeat the same operation until all concentrations of the standards have been entered (Figure-27).
- Step 7: Measure the Absorbance of each standard. For each measurement, insert the standard into Sample Compartment and double click in the appropriate Absorbance cell (Abs) next to the standard C/Std or type in the current

Abs display from **Test Status Display** to get the **Absorbance** for curve drawing. Continue until all of the standards have been measured

Step 8: Press the **Draw** button to graph the **Standard Curve** (Figure-28). You may **save** it for future use.

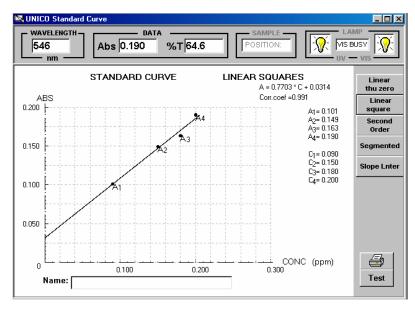


Figure-28 Standard Curve Graphic Display

Your standards have now completed setup. To use the graph and measure the unknown sample concentrations, please be guided by the steps below:

Step 1: Select the desired Standard Curve by clicking on one of the five buttons (Figure-29). Shown in Figure-28 is Linear Squares (Least Squares Method). Items in the equation next to the Linear Squares title on the graph are Abs, the slope, and y-intercept as well as Correlation Coefficient

> Abs = slope \* C + y-intercept Corr. Coef = Correlation Coefficient

- Step 2: (optional) Click **Print** icon button: print the graph and labels of the slope, yintercept and Correlation Coefficient as seen on the screen.
- Step 3: When ready to measure samples of unknown concentration, press the **Test** button to return to the main Standard Curve screen (Figure-26).
- Step 4: To measure the concentration of unknowns, place the samples in the Sample Compartment and click on **Test** button, located at the bottom-left portion of the screen.

Step 5: To save the data with the **Standard Curve** fit selected, click on the **I** (Save Icon), name the file, and click **Save**.

💐 UNICO Standard Curve	
546 Abs 0.190 %T 64.6 POSITION:	
	Linear thu zero Linear square
	Second Order
	Segmented
	Slope Lnter
	Test

Figure-29 The Five Function Buttons of **Standard Curve** 

#### Kinetics

The **Kinetics** application has the following functions:

- Setup kinetics Test Parameters
- Obtain kinetics data for a sample at a single wavelength
- Load and save data files for further studies

#### Main Screen of Kinetics

At the **Main Screen**, click **Application**, check **Kinetics** (Figure-17), and click **OK** button to enter the **Main Screen of Kinetics.** Type **Sample Name**, **Operator** (name), **Filename**, and **Date** into the appropriate text fields (Figure-30).

The following are the basic operation procedures.

- Step 1: Insert **reference** cuvette or nothing into the Sample Compartment and close the lid.
- Step 2: Select the desired **wavelength** by clicking **wavelength** button on the PC screen to set or typing in the desired **wavelength**, click **Goto** button at the right of **button** to set the wavelength.
- Step 3: Click on **0A** button to **blank** the reference.
- Step 4: Set the **TEST SETUPS** (**Step 4**~**Step 8**). Set the Total Run Time by typing into the Text Field on the right of the **TOTAL RUN TIME** label. The three blocks represent hour, minute, and second respectively.

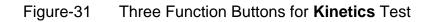
🗠 UNICO Kinetics	
WAVELENGTH     Data       546     Abs 0.000     %T 100.0	SAMPLE LAMP POSITION: VIS BUSY UV - VIS
DATA SCREEN Sample Name: Water Operator: <u>kathy</u> Filename: <u>Test6</u> Date: <u>5/09/2002</u> Time: <u>14:14:43</u> WL: <u>546</u> Mode: <u>Abs</u> Factor: Units:	Application Application WAVELENGTH SETUP: WAVELENGTH: 546 Goto TEST SETUP: TOTAL RUN TIME: : : : 30 INTERVAL TIME: : : : 30 INTERVAL TIME: : : : : 31 INITIAL DELAY: : : : : : : : : : : : : : : : : : :

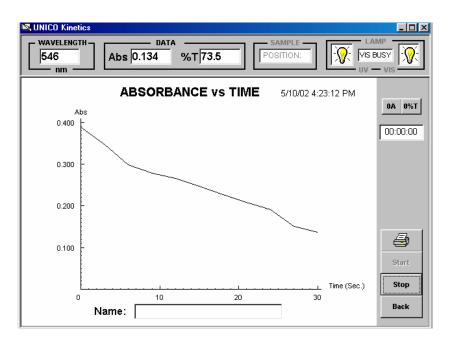
Figure-30 Kinetics Main Screen

- Step 5: Set **INTERVAL TIME** similar as **Step 4**. This is the time interval for which measurements will be recorded (i.e. every 10 s, or every 3 s, etc.).
- Step 6: Set an **INITIAL DELAY** similar as **Step 4**. The purpose of this step is to delay the beginning of data collection. (i.e. Sample must be injected, and reaction will not begin for 20 s).
- Step 7: Set a **FACTOR** (multiplication factor--dilution factor) similar as **Step 4**. This allows for a factor to be used when calculating the **Concentration** of the solution.
- Step 8: Set the **HIGH** and **LOW** Limits of the graph similar as **Step 4**. This is the selection of the minimum and maximum **Absorbance** range for the graph of the data.
- Step 9: Type the unit in the Text Field at the right of the **UNITS** label. Place your sample in the and click the **TEST** button once all the **TEST SETUPS** have been set and you are ready to start your measurement
- Step 10: Click **Start** button to begin test (You may type the name of the Kinetics test in the text field at the right of the Name label, like "Water" of this sample test, see Figure-31).

Start button: start the Kinetics test Stop button: stop the data collection at any given moment Back button: go back to the Kinetics Test Display Screen

NICO Kinetics	_ 🗆 ×
WAVELENGTH         DATA         SAMPLE           546         Abs 0.000         %T 100.0         POSITION:         VIS B           nm         N         VIS B         VIS B         VIS B	
5/20/2002 1:57:43 PM	0A 0%T
	Start
Name: Water	Stop Back







#### Data import to Microsoft Excel®

By referring to the following steps, you can transfer any of the UNICO<sup>®</sup> Application Software—2100 test data to a Microsoft Excel<sup>®</sup> program:

- Step 1: In Microsoft Excel, click on File and click Open.
- Step 2: Select any saved file you wish to import.
- Step 3: After the Excel Text Import Wizard appears, select **Delimited**, select the row from which you want the import to start, and click on the **Next** button as shown in Figure-33.

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2		
3	The Text Wizard has determined that your data is Delimited.	
4	If this is correct, choose Next, or choose the data type that best describes your data.	
5	Original data type	
6	Choose the file type that best describes your data:	
7	Delimited     - Characters such as commas or tabs separate each field.	
8	C Fixed width - Fields are aligned in columns with spaces between each field.	
9	Start import at row: 1 Start File origin: Windows (ANSI)	
10	Start import at <u>r</u> ow: 1 🚔 File <u>origin</u> : Windows (ANSI)	
11		
12	Preview of file C:\WINDOW5\Desktop\water.tst.	
13	1 "Unico Test"	
14	2 "Test Date: 03-13-2002"	
15	3 "Test Time: 12:04:07 PM"	
16	<u>4</u> ""	
17	52	
18		2
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20	Cancel < Back Next > Finis	
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Figure-33 Excel Text Import Wizard I

Step 4: Uncheck the **Tab** delimiter and select **Comma** delimiter as shown in Figure-34, then click the **Next** button.

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4		This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.															
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Figure-34 Excel Text

- Step 5: Click the **Finish** button and the test data will be imported into your Excel spreadsheet. Here, further calculations can be performed from the "raw" data collected.
- Step 6: Save the imported file under a DIFFERENT FILE Name if you still want to keep and open the original **UNICO**<sup>®</sup> data file in **2100**. Otherwise, the original **UNICO**<sup>®</sup> data file (.tst file) will be modified by the Excel® format during importing and the modified file cannot be opened from **2100**.