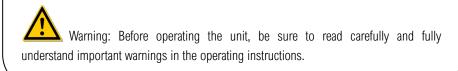


# MetaSpec Pro (Software) Instruction Manual

Thank you very much for purchasing our Kalstein's Software MetaSpec Pro.

Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the "Warranty" at a hand place for future reference.







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#### 1 Introduction

MetaSpec Pro analysis software is a new version of PC software for UV-Vis or Visible spectrophotometer written by professional software engineers of our company.

We reserve all rights of this software. No reproduction by any means is allowed without acknowledgement.

The MetaSpec Pro analysis software has powerful functions, such as instrument control, measurement, data analysis and data processing. User management, file security and 3D spectrogram are also available.

The main measurement functions contain Standard Curve, Photometric Analysis, Quantitative Analysis, Kinetics Analysis, Wavelength Scan, Multi-wavelength Analysis and DNA/Protein Analysis.

With this software, user can control the instrument, set parameters, complete measurement and other relative operation conveniently.



#### 2 Installation

This chapter will show users the requirement of system configuration and the steps of installation and uninstall for MetaSpec Pro analysis software.

2.1 System configuration Requirement

Following system configuration of PC is required:

- ♦ Core i3 dual-core or faster processor
- ♦ CD-ROM drive
- ♦ 2 USB interface
- ♦ 2G or more RAM
- ♦ 1G or more hard disk space
- ♦ Microsoft Windows 7 or Windows 8 operating system (Also support Windows XP)
- 2.2 Software Installation

Install MetaSpec Pro analysis software with following steps:

- Step 1: Put the CD of MetaSpec Pro analysis software into CD-ROM drive of PC.
- Step 2: In the CD-ROM root directory, double-click "MetaSpec\_Pro\_EN\_Setup.exe." to start the installation progress. Click [Next] in the setup dialog, select "I accept the terms in the license agreement", and click [Next] to continue the installation progress.

🛃 MetaSpec Pro Setup		🐱 MetaSpec Pro Setup
	Welcome Valcane to the installer for MetaSpec Pro 2.2. It is strongly recommended that you exit all index provide the second	
	< Back Mext > Cancel	Cancel
	< Back Mext > Cancel	< ğack Mext > Çancel

Step 3: Click [change...] button to select the installation directory, then click [Next], it's ready to install MetaSpec Pro analysis software. Click [Next] to proceed with the installation. It will create a shortcut folder on the Desktop after installing files, and then it will suggest that the installation is successful.

MetaSpec Pro Setup	😼 MetaSpec Pro Setup
Installation Folder Where would you like MetaSpec Pro to be installed?	Ready to Install You are now ready to install HetaSpec Pro 2.2
The software will be installed in the folder listed below. To select a different location, either type in a new path, or click Change to browse for an existing folder.	The installer now has enough information to install MetaSpec Fro on your computer.
Install MetaSpec Pro to:	The following settings will be used:
C:\Program Files (x88)\MetaSpec Pro Change	Install folder: C:\Program Files (x86)\MetaSpec Pro
citatie	Shortcut folder: MetaSpec Pro
Space required: 12.7 MB Space evailable on zelected drive: 29.79 GB	Please click Next to proceed with the installation.
< Beck Bert > Cancel	<back rext=""> Quncel</back>
MetaSpec Pro Setup	MetaSpec Pro Setup
MetaSpec Pro Setup  Installing HetaSpec Pro Plesse vait  Installing Files C:WetaSpec ProNtrofile\St@Curve.cfg	MetaSpec Pro Setup Installation Successful The MetaSpec Pro 2.2 installation is complete. Thank you for choosing MetaSpec Pro! Please click Finish to exit this installer.

Step 4: The final installation process contains the installation of CP210x USB driver, click [Install] to install it. If the CP210x USB driver has already installed, it will give a notice, just click [OK] to update the driver.

೫ Silicon Laboratories CP210x USB to UART Bridge Driver Installer	Notice
Silicon Laboratories Silicon Laboratories CP210x USB to UART Bridge Driver Version 6.5.3	These drivers are already current and up to date, to remove these go to Add/Remove Programs in the Control Panel
Install	ОК

At last, click [Finish] to exit the installation process of MetaSpec Pro analysis software.

#### 2.3 Software Uninstall

There are two ways to safely uninstall MetaSpec Pro analysis software.

- One way, through [Control Panel], enter the [Add or Remove Programs] dialog, select [MetaSpec Pro], and click the [uninstall] button.
- The other way, in the [Start] menu, select [MetaSpec Pro] and [Uninstall MetaSpec Pro] in [All Programs], and the uninstall progress will automatically uninstall the MetaSpec Pro software.

#### 3 Basic Application

This chapter will show users the basic application of MetaSpec Pro analysis software, such as how to run the software, be familiar with the interface and tools, and manage the user information.

#### 3.1 Run the software.

There are two ways to run MetaSpec Pro analysis software. Make sure that the UV Key has already been inserted to user's computer, then, run MetaSpec Pro analysis software.

One way, double-click the shortcut icon on the Desktop to run the program.

The other way, in the [Start] menu-> [All Programs] -> [MetaSpec Pro] -> [MetaSpec Pro], click [MetaSpec Pro] to run the program.

For the first launch, user can login the system with the username "admin" and password "a12345".

User also can click the button Anonymous in the login window to enter the main interface of the

software. For the next launch, user can login the system with a new username and a new password. About modification of the username and password, please refer to chapter 3.4.

Note: Only administrators have the right to manage the user and user privileges. Login with the username "admin" and password "a12345" is suggested for the first launch.

login	<b>X</b>
	MetaSpec Pro
More accurate,	more efficient
	V:2.2
User Name	
Password	
	Anonymous login Exit

When entering the interface of the software, a window for parameters of the device will be shown.

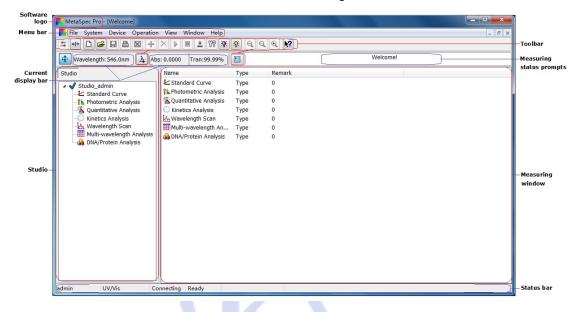
Parameters			×	-
Default Company				
Connect	Yes	Automatic Identification port	Yes 🔻	
UV/V	UV	Communication port	COM3 -	
Deuterium lamp state	On	Baud Rate	115200	
Tungsten lamp state	On	Switching Wavelength	340.0nm	
Max wavelength	1100nm	Min switching wavelength	320nm	
Min wavelength	190nm	Max switching wavelength	360nm	
Bandwidth	2nm			
		Confirm	🔀 Cancel	

User can view the parameters and modify the Company name. Whether choose the Automatic

Identification port or not also can be set up. Finally, click the button **Confirm** to exit the parameters window. User also can close the window directly without any modification.

3.2 Main interface

The main interface of the software is described as following:



#### 3.3 Menu bar and Toolbar

This software provides the Menu bar and Toolbar to user for easy access to different functions. At the same time, the pop-up menu of right click includes most commonly used functions to speed up user's operation.

#### 3.3.1 Menu bar

The menu bar contains File, System, Device, Operation, View, Window and Help, respectively shows as following:

1) File & the drop-down menu

File	System [	Device	Opera
D	New	Ctrl	+N
<b>2</b>	Open	Ctrl	+0
$ \mathbf{X} $	Close	Ctr	l+C
	Save	Ctr	l+S
	Save As	Ctr	+A
	Save the ch	art	
₽	Print	Ctr	l+P
	Export to e	xcel Ctr	l+E
8	Exit	Ctr	+X

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2) System & the drop-down menu

Syst	em Device Operation Vi	ew	Windo
<b>\?</b>	Change the Password	Ctr	+P
	Security Settings	Ctr	+S
	User Group management	Ctrl	+G
	User Management	Ctrl	+U
	User Rights	Ctrl	+R
	Standard Curve managemen	t Ctrl	+C
	Historical data management	Ctrl	+H
	System Log	Ctr	l+L
	Language		

3) Device & the drop-down menu

Dev	ice Operation View	Window Help
	Parameters	Ctrl+P
$\underline{\lambda}$	Wavelength positioning	Ctrl+W
	Wavelength Calibration	Ctrl+C
	Switching Point	Ctrl+S
<b>:?</b> :	Deuterium lamp	•
<del>??</del> ?	Tungsten lamp	+
	Dark Current	
	Energy Detection	

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4) Operation & the drop-down menu

One	eration View	Window He	
(Opt	Connect	Ctrl+C	1
+ +	Release	Ctrl+R	
+	Add	Ctrl+A	
×	Delete	Ctrl+D	
	Start	Ctrl+S	
- FF	Batch Start	Ctrl+B	
	Stop	Ctrl+T	
<u>*</u>	Set to Zero	Ctrl+Z	
88	Parameter set	tings Ctrl+P	
R	ReadOnly		
-	Writable		

5) View & the drop-down menu

1	Viev	v Window Help	
	4		
	Q	Chart Zoom	۲
		Chart Move	۲
	Q	Chart Setting Ctrl+S	
		Display Mode	۲

6) Window & the drop-down menu

Win	dow Help	
۳.	Cascade	Ctrl+B
	Tile Horizontally	Ctrl+H
	Tile Vertically	Ctrl+V
	Arrange All	Ctrl+A
	Minimize All	Ctrl+M
✓ 1	Welcome	

7) Help & the drop-down menu

Hel	P
•	Help topics
<b>\?</b>	About Ctrl+A



# 3.3.2 Toolbar

The toolbar contains all icons that described as following:

Item	List	lcon	descriptions
	New	D	Create a new file.
	Open		Open the file with saved test data.
File management	Save		Save the file with test data.
	Print		Print the test report.
	Export	X	Export the test report to Excel.
	Connect	ŧ	Connect the device.
	Release	+	Release the device.
	Add	+	Add a row to the datasheet for a new test.
	Delete	×	Delete the test record.
	Start		Start the measurement.
Operation	Batch start	*	Start a batch measurement.
Operation	Stop		Stop the measurement.
	Zero / Baseline	+!	Set zero and do blank calibration or baseline calibration.
	Set wavelength	À	Set the operating wavelength.
	Read only	R	The file can be read only.
	Writable		The file is writable and can be modified.
	User privileges	<b>P</b>	Set user privileges.



ltem	List	lcon	descriptions
	Parameter settings	<b>19</b>	View the parameter settings.
	Tungsten lamp	<b>陝</b> ~ 陝	Show the status (on/off) of tungsten lamp.
Information viewing	Deuterium lamp	<b>*</b> ~	Show the status (on/off) of deuterium lamp.
	About	▶?	Software version information and product ID information.
	Message list		Report messages about running conditions of the software.
	Zoom in	Ð	Zoom in the spectrum.
	Reset	Q	Reset the spectrum.
	Zoom out	Ø	Zoom out the spectrum.
Spectrum	Move left	-	Make the spectrum move left.
management	Move up	<b>*</b>	Make the spectrum move up.
	Move down	Ţ	Make the spectrum move down.
	Move right	•	Make the spectrum move right.
	Graph settings		Set graphical parameters.
	Absorbance	Α	Choose absorbance as displaying mode.
Display mode	Transmittance	T	Choose transmittance as displaying mode.
	Concentration	С	Choose concentration as displaying mode.



#### 3.3.3 Pop-up menu of right click.

When right click at the data sheet in the measuring window, there will be a pop-up menu that includes most commonly used functions to speed up user's operation. The pop-up menu of right click is shown as following:

#	Connect	Ctrl+C
<b>* </b> *	Release	Ctrl+R
D	New	Ctrl+N
<b>2</b>	Open	Ctrl+O
X	Close	
+	Add	Ctrl+A
×	Delete	Ctrl+D
	Start	Ctrl+S
••	Batch Start	Ctrl+B
	Stop	Ctrl+T
<u>*</u>	Set to Zero	Ctrl+Z
۳9	Parameter settings	Ctrl+P
Q	Chart Setting	
	Graphical display s	ettings
	Save	
	Save As	
₽	Print	Ctrl+P
$\mathbf{X}$	Export to excel	Ctrl+E
<b>\?</b>	About	

#### 3.4 User and User Privileges

In the system of MetaSpec Pro analysis software, the management of user and user privileges is based on user groups. Create user groups first and set the user privileges. Then, create user data. The user privileges are determined by the user group that the user belongs to. There are two default user groups in the system, administrator group and guest group. The administrator group has the most privileges, and the default privileges can't be edited. Only the users in administrator group can enter following interfaces: Security Settings, User Group management, User Management and User Rights.

#### 3.4.1 Password modification

Select the main menu [System] -> [Change the Password] and enter the password modification window. Input the old password and the new password, then input the new password again, and

click the button complete the modification. So that user can launch the system with the new password next time.

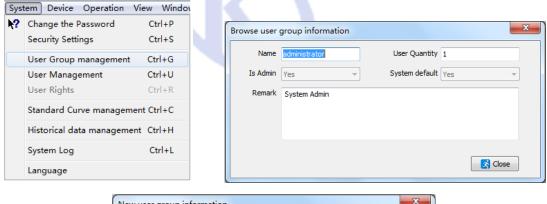
http	os://kalstein.eu			
Sys	tem Device Operation Vie	w Windov		
N?	Change the Password	Ctrl+P	Change the password	
	Security Settings	Ctrl+S		_
	User Group management	Ctrl+G	old Deserved	
	User Management	Ctrl+U	Old Password	
	User Rights	Ctrl+R	New Password	
	Standard Curve management	t Ctrl+C	Enter again	
	Historical data management	Ctrl+H		
	System Log	Ctrl+L		
	Language			Confirm 🥂 Cancel

3.4.2 User group management

Select the main menu [System] -> [User Group management] and enter the user group management window. There are two default user groups in the system, administrator group and guest group. User can browse the information of each user group by double click when the cursor points to the corresponding group.

User can click the shortcut icon 主 in the toolbar to create a new user group. Input the group

name and user quantity, then click the button *confirm* to save the new information.



New user gro	oup information	x
Name		User Quantity 0
Is Admin	No 🔻	System default No
Remark		
		Confirm Cancel

📕 MetaSj	pec Pro - [User Group	p]				
📕 File	System Device O	peration View				_ <i>B</i> ×
*** <b>&gt; </b> *		X 🕂 🗙 🛛		19 🖡 🛠 🛠 Q Q Q 🔍 K	?	
👍 Wa	velength: 546.0nm	Abs: 0.00	02 Tran:9	9.96%	Welco	ome!
Name	User Quantit			emark		
▶ administr	ator			ystem Admin iuest		
guest		1 NO	res G	uest		
						=
admin	UV/Vis	Connecti	ng Ready	Please set zero first		<b>▼</b>

3.4.3 User management

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Select the main menu [System] -> [User Management] and enter the user management window. User can browse the information of each user by double click when the cursor points to the corresponding user.

User can click the shortcut icon 主 in the toolbar to create new user information, such as input

Code, Name, Department, Tel (Telephone), E-mail, etc. Click the button Grant to save the

information. User can login the system with the code as username and the new password a12345 so that the new information can be used on test report when printing.

Sys	tem Device Operation V	iew Windov	Browse user	information		
<b>\?</b>	Change the Password Security Settings	Ctrl+P Ctrl+S	Code	þdmin	Name	admin
	User Group management	Ctrl+G	Group Name	administrator 💌	System default	Yes
	User Management	Ctrl+U	Department	System	Tel	
	User Rights	Ctrl+R	E-Mail			
	Standard Curve manageme	nt Ctrl+C	Remark			
	Historical data managemen	t Ctrl+H				
	System Log	Ctrl+L				
	Language					🔀 Close

		rmation			
	Department E-Mail	guest	Name System default Nr Tel	0	
	Remark		Conf	firm 🔀 Cancel	
MetaSpec Pro - [User]					
File System Device					- 5
# 📲 🗅 🚅 🗎 🗎		± 177 🕸 🕸 Q Q (	€ 💦		
Wavelength: 546.0nm	À Abs: 0.0002 Tra	an:99.96%		Welcome!	
Code Name	Group Name	Department Tel	E-Mail	Remark	
admin admin anonymous anonymous	administrator s guest	System System			

#### 3.4.4 User rights

In the user group management interface, the further management of user rights is available. User can browse the user rights of administrator group without editing by clicking the shortcut icon

ullet in the toolbar when the cursor points to administrator group. User can browse the user

rights of guest group by clicking the shortcut icon in the toolbar when the cursor points to guest group and edit the user access rights.

In the user access rights editing window, double click to change the status of user access right

when the cursor points to the row that need editing, then click the button Gonfirm to make sure

the editing and exit the window.

It's also available to manage the user rights by selecting the main menu [System] -> [User Rights] when the cursor points to some group in the user group management interface.

Syst	tem Device Operation \	/iew	Window
N?	Change the Password	Ct	rl+P
	Security Settings	Ct	rl+S
	User Group management	Ct	rl+G
	User Management	Ct	rl+U
	User Rights	Ct	rl+R
	Standard Curve manageme	ent Ct	rl+C
	Historical data managemen	nt Cti	rl+H
	System Log	Ct	rl+L
	Language		

Name	Purview	Remark	
Standard Curve	True		
Photometric Analysis	True		
Quantitative Analysis	True		
Kinetic Analysis	True		
Wavelength Scan	True		
Multi-wavelength Analysis	True		
DNA/Protein Analysis	True		
Standard Curve Management	True		L
Historical Data Management	True		
System Log	True		

lame	Purview	Remark	
Standard Curve	1 True		
Photometric Analysis	True		
Quantitative Analysis	True		
ünetic Analysis	True		
Vavelength Scan	True		
Aulti-wavelength Analysis	True		
NA/Protein Analysis	True		
Standard Curve Management	True		
listorical Data Management	True		
System Log	True		

3.4.5 System security setting

Select the main menu [System] -> [Security Settings] and enter the security settings window. The system security such as Password lifetime, Password length, and Security can be set up.

The default path of the data file is "D:\MetaSpec". The data will be saved in the folder of "DataFile" automatically. User also can save the file to another path.

			System security settings	
	tem Device Operation V Change the Password Security Settings User Group management	Tiew Windov Ctrl+P Ctrl+S Ctrl+G	Password lifetime  Password never expires  Password expires in 5 days	Anonymous Login          Image: Allow Anonymous Login         Data file path         D: WetaSpec
	User Rights	<b>Ctrl+U</b> Ctrl+R	Password length           Image: Constraint of the second s	Security
	Standard Curve management Ctrl+C       Historical data management Ctrl+H       System Log     Ctrl+L       Language		Minimum password length of 5 characters	☑ At 5 Login failed to exit
			V Allow a blank password	for 1 minutes,Locking system in the system is idle
				Apply Confirm Cancel

#### 3.5 Data processing

The MetaSpec Pro analysis software has a powerful function of Data processing, such as creating a new test file, Data saving, Data opening, Data printing, and exporting the data to Excel. The

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graph also can be saved separately for subsequent processing.

All the spectra contain standard curve, time scanning curve and wavelength scanning curve can be zoomed in, zoomed out or reset freely. Moving left, right, up or down is also at will.

Graph settings, such as setting the coordinates range and 3D Effect is available.

For a wavelength scanning curve, peak and valley marking, and characteristic value marking are also available.

4 Instrument Control

This chapter will show users how to control the instrument with MetaSpec Pro analysis software, such as Connect/Release PC, set wavelength, set switching point of the light source, turn on/off Deuterium lamp and turn on/off Tungsten lamp.

4.1 Connect/Release PC

Fig. a

Connect PC: Before connecting, connect the instrument and PC with USB Cable, and insert the UV Key to user's computer. Switch on the power of the instrument. After Diagnostic program and Warm up procedure, it will go into the Main Menu.



Main menu of UV-5 series

WL: 546.0 nm 0.000 T. A. C. F.

Fig. b Main menu of UV-5100(B)

Then, run MetaSpec Pro analysis software, it will search the communication port, and connect the instrument automatically. Otherwise, click the shortcut icon 📰 [Connect] in the toolbar, or

operate in the main menu [Operation] -> [Connect].

Release PC: Click the shortcut icon [Release] in the toolbar or operate in the main menu [Operation] -> [Release] to release the instrument.

Оре	eration View Win	ndow Help
<b>t</b> ;	Connect	Ctrl+C
H.	Release	Ctrl+R
ł	Add	Ctrl+A
X	Delete	Ctrl+D
	Start	Ctrl+S
•	Batch Start	Ctrl+B
	Stop	Ctrl+T
¥.,	Set to Zero	Ctrl+Z
79	Parameter settings	; Ctrl+P
R	ReadOnly	
	Writable	

4.2 Set the wavelength.

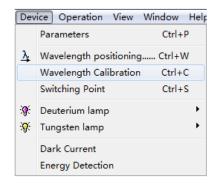
Select the main menu [Device] -> [Wavelength positioning.....] or click the shortcut icon in the toolbar to set the operating wavelength, it will pop up a dialog.

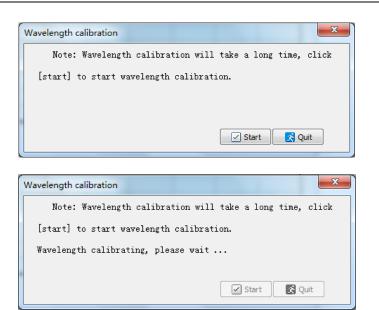
Dev	ice Operation View	Window Help	
	Parameters	Ctrl+P	
$\underline{\lambda}$	Wavelength positioning.	Ctrl+W	Operating wavelength setting
	Wavelength Calibration Switching Point	Ctrl+C Ctrl+S	Operating wavelength (nm) 546.0
≫ ?	Deuterium lamp Tungsten lamp	+ +	
	Dark Current Energy Detection		Confirm 🔀 Cancel

Input the wavelength value and click the button for the confirment to confirm the setting. Then, the device will go to the setting position, and it will be shown in the current display bar.

4.3 Calibrate the wavelength.

Select the main menu [Device] -> [Wavelength Calibration] to calibrate the wavelength. There will be a dialog. Click the button for start the calibration, a further message will be given.





After the calibration has completed, another message will be given:

Wavelength calibration	X								
The wavelength calibration has completed,									
click [Quit] to exit the dialog box!									
	Start 🔀 Quit								

Click the button **Click the dialog of wavelength calibration**.

4.4 Set switching point of the light source.

Select the main menu [Device] -> [Switching Point] to set the switching point of the light source. The valid range is from 320nm to 360nm.

Dev	ice Operation View Window Hel	
	Parameters Ctrl+P	
<u>λ</u>	Wavelength positioning Ctrl+W	Switching Point Settings!
	Wavelength Calibration Ctrl+C	
	Switching Point Ctrl+S	Switch wavelengths (nm) 340.0
<b>:</b>	Deuterium lamp	Switch wavelenguis (inty
<b>:</b> @:	Tungsten lamp	
	Dark Current Energy Detection	Confirm Cancel
	chergy betection	

#### 4.5 Turn on/off Deuterium lamp.

Select the main menu [Device] -> [Deuterium lamp] -> [Off] to turn off Deuterium lamp. Then, the status of Deuterium lamp will be shown as in the toolbar. Otherwise, select the main menu



[Device] -> [Deuterium lamp] -> [On] to turn on Deuterium lamp. Then, the status of Deuterium

lamp will be shown as 🕅 in the toolbar.

Dev	rice Operation View Wi				Dev	ice Operation	View W	/indow H	lelp	
	Parameters	Ctrl+P				Parameters		Ctrl+P		
<u></u>	Wavelength positioning Wavelength Calibration Switching Point	Ctrl+W Ctrl+C Ctrl+S			<u>}</u>	Wavelength po Wavelength Cal Switching Point	libration	Ctrl+W Ctrl+C Ctrl+S		
<b>%</b>	Deuterium lamp	•	$\checkmark$	On Ctrl+O	- <u>@</u> -	Deuterium lam	2			On Ctrl+O
<b>:</b> ?:	Tungsten lamp	•		Off Ctrl+F	-0 	Tungsten lamp	-		• 🗸	Off Ctrl+F
	Dark Current Energy Detection					Dark Current Energy Detectio	on			

4.6 Turn on/off Tungsten lamp.

Select the main menu [Device] -> [Tungsten lamp] -> [Off] to turn off Tungsten lamp. Then, the status of Tungsten lamp will be shown as in the toolbar. Otherwise, select the main menu [Device] -> [Tungsten lamp] -> [On] to turn on Tungsten lamp. Then, the status of Tungsten lamp

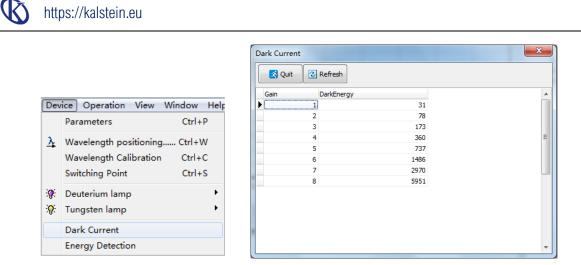
will be shown as 🔯 in the toolbar.

Dev	ice Operation View Window Hel		Dev	ice Operation View V	Vindow He	F	
<u>}</u>	Parameters Ctrl+P Wavelength positioning Ctrl+W Wavelength Calibration Ctrl+C Switching Point Ctrl+S		<u>}</u>	Parameters Wavelength positioning Wavelength Calibration Switching Point	Ctrl+P Ctrl+W Ctrl+C Ctrl+S		
<u>.</u>	Deuterium lamp		÷9;	Deuterium lamp	•		
÷.	Tungsten lamp	✓ On Ctrl+O	÷9;	Tungsten lamp			On Ctrl+O
	Dark Current Energy Detection	Off Ctrl+F		Dark Current Energy Detection		✓	Off Ctrl+F

4.7 Dark Current Detection

Select the main menu [Device] -> [Dark Current] to detect the dark current. The system will read the dark energy at different gain automatically. User can read the data of dark current again by

clicking the button errest in the dark current displaying window.



#### 4.8 Energy Detection

User can do energy scanning by the function of energy detection. The self-testing of bandwidth also can be done. Select the main menu [Device] -> [Energy Detection] to enter the interface of energy detection. User can set scanning parameters such as Start wavelength, End wavelength, Interval and Scan times, and select suitable Light Source in the energy detection setting window.

Ī	Dev	ice Operation View	Window Help
		Parameters	Ctrl+P
	$\frac{\lambda}{2}$	Wavelength positioning	g Ctrl+W
		Wavelength Calibration	Ctrl+C
		Switching Point	Ctrl+S
	<del>.</del> .	Deuterium lamp	+
	<del>?</del> ?:	Tungsten lamp	+
		Dark Current	
		Energy Detection	

📕 MetaSpec Pr	o - [Energy Detection]							<u> </u>			
File System	m Device Operation	n View Window H	elp					_ 8 ×			
🔹 Waveleng	gth: 440.0nm 🛕 Ab	s: 0.0002 Tran:99.9	6%		Welco	me!		,			
15,000 -		Energy detection	-					- 1 A . I			
13,500 -		File attributes Paran	neters Mark			th Energ	y Gain	Peak/Valley			
12,000 -		Company Start wavelength	Default Company Name	Scan Times							
10,500 -		-	650	Gain							
9,000 -		Interval(nm)	0.1 -	Filter	None 👻						
- 			65535 Default		deuterium lamp 👻						
6,000			0 Default	Display Peak Display Valley	Print Chart Print Data						
		in respective	Peldat								
4,500 -					onfirm 🔀 Cancel						
3,000 -											
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o I	651 652.5 6	54 655.5 657	658.5 660	661.5 663 6	64.5						
		Wavele	ngth(nm)			Peak and Valley Data		, , , , , , , , , , , , , , , , , , ,			
admin	UV/Vis Co	onnecting Ready	Please set zero f	irst				.4			



#### 5 Measurement Operation

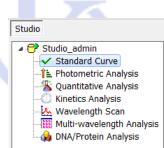
This chapter will show users the main measurement functions of the software such as Standard Curve, Photometric Analysis, Quantitative Analysis, Kinetics Analysis, Wavelength Scan, Multi-wavelength Analysis and DNA/Protein Analysis.

It contains all the procedures of each measurement function. The operations are also available through pop-up menu of right click in the data sheet after entering each measurement interface.

5.1 Standard Curve

A calibration curve will be established by measuring the absorbance of a group of standard solutions. Four fitting methods as following can be chosen to establish the standard curve: Linear fit through zero, Linear fit, Quadratic fit and Cubic fit.

- 5.1.1 Measurement for Standard Curve
- 1. Select Standard Curve in the Studio and click the shortcut icon D in the toolbar to set parameters and create a new standard curve file. User also can double click Standard Curve in the Studio directly to create a new file. There will be a child window for standard curve settings.



📕 MetaSpec Pro - [Standard Curve]						_ <b>D</b> X					
본 File System Device Operation	n View Window I	Help				_ 8 >					
📰 🐽 🗅 😂 🗖 🖶 🚽		L 179 🖪 🖤 🛠 🛠		1	▶?						
Wavelength: 546.0nm 🛕 Ab	s: -0.0004 Tran:100	0.08%		W	elcome!						
4	4 No. Name										
3.6	Standard curve Sett	ings (New)			×						
3.2	File attributes Par	ameters Wavelength List	Standard Sample List								
2.8				1							
9 2.4 2 2 4 1.6	Company	I									
4 2	Curve name	Test									
	No. of WL.		No. of Std Samples	4							
1.2											
0.8	Unit	ug/ml 👻	R	0							
0.4		Linear fit through zero	К1	0							
	1	🔘 Linear fit	KO	0							
		Quadratic fit	K2	0							
Wavelength List Parameters of fitting cru		Cubic fit	КЗ	0							
No. Wavelength Parameter 1 Pa											
-				Confirm 🔀 Cance							
				•		,					
admin UV/Vis Co	onnecting Ready	Please set zero first				,					



- 2. Set parameters such as choosing Fitting method and Unit, setting Number of wavelengths and Number of standard samples.
- 3. Set up the wavelength(s) and calculation parameters in the window of Wavelength list: Click the setting bar and input the wavelength value when the cursor points to it, and press Enter key to confirm the setting. Set the calculation parameters with the same operations. User can click

the shortcut icon 庄 and set up more wavelengths, the wavelength also can be deleted by

clicking the shortcut icon 🔀

ſ	Standa	ard curve	Settings (Nev	v)					X
	File at	tributes	Parameters	Wavelength List	Standard Sa	ample Lis	t		
		+×	Calculate fra	iction					
L		No.	Wavelength	Parameter 1 Pa	rameter 2 Zero	oed	ItemMark		
		▶ <u>1</u>	44	0.0 1	0	0			
L									
L									
ľ									
		•							
							Confirm	🔀 Cancel	

4. Set up the concentration of standard samples in the window of Standard sample list: Click the setting bar and input the values of standard concentration when the cursor points to Conc.

Column, and press Enter key to confirm each setting. User can click the shortcut icon and set up more standard samples, the standard samples also can be deleted by clicking the

shortcut icon 🔀

		_	ettings (New					×
File att	tributes		Parameters	Wavelen	gth List	Standard	Sample List	
	+>							
	No.		Name		Conc.	Abs.	Remark	*
		1	1#StdSample		0			
			2#StdSample		0.1			
	_	3	3#StdSample		0.2			
	•	4	4#StdSample		1			
								E
	•							
							Confirm	🔀 Cancel

Then, confirm the settings by clicking the button **Confirm** in the child window.

- 5. Put the Reference solution of standard samples into the light path, click the shortcut icon in the toolbar, the device will go to the operating wavelength first, then the system will calibrate the blank and set to 0.000Abs/100.0%T.
- 6. Measuring with single wavelength: Put one Standard sample solution into the light path and

click the shortcut icon in the toolbar to start the measurement when the cursor points to the corresponding concentration. The absorbance (Abs) will be recorded in Abs. column. Measure other Standard sample solutions with the same operations.

Click the shortcut icon in the toolbar to start a batch measurement if measuring with several wavelengths.

User can view the standard curve in graphics area after all standard samples have been measured. And the parameters of fitting curve containing correlation coefficient will be shown in the window below the graphics area.

🖌 File System I	Device Opera	ation View	Window H	lelp								_ 8
		+ X 🕨	▶ ■ 🛓		) 🔆 🔅 (			<b>i</b>	Q M	2		الكالك
Wavelength: 4		Abs: -0.0002							Welco	2		
1		ЧL							No.	Name	Conc	Result(Abs) A
0.9										1 1#StdSample	0	-0.0002
1										2 2#StdSample	0.1	0.0319
0.8	L									3 3#StdSample	0.2	0.0671
0.7							· · · · · · · · · · · · · · · · · · ·		<u>ا ا</u>	4 4#StdSample	1	0.3359
90.6 40.5 40 40 40 40 40 40 40 40 40 40 40 40 40												
e 0.5							····-					
8												
1				*								
0.3							· · · · · · · · · · · · · · · · · · ·					
0.2												
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0 ***												
0 0.	.2 0.4	0.6	0.8	1 1.2	1.4	1.6	1.8	2				
			Conc	entration								
Vavelength List Pa	rameters of fitting	cruve										
Parameter name	Paramete	er values										
ReadOnly/Writable Att												
Fitting methods		, through zero										
Formula		2.9906 * A, R=1.	.0000									
Jnit	ug/ml											
(1		ethods=Linear fit	through zero									
2	1.0000		-									
									_			
									•			•

7. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test data. The file will be saved in ". Std" format. Click the shortcut icon 🗎 in the toolbar to print the test report. The data also can be exported to Excel by clicking the shortcut icon 🕅 in the toolbar.

#### 5.2 Photometric Analysis

The values of Absorbance (Abs) and Transmittance (T) are available with this function. The value of concentration is also available by selecting the option of "Calculate the concentration".

5.2.1 Measurement for Photometric Analysis

1. Select Photometric Analysis in the Studio and click the shortcut icon D in the toolbar to set

parameters and create a new photometric analysis file. User also can double click Photometric Analysis in the Studio directly to create a new file. There will be a child window for photometric analysis settings.

Studio		
Venture Supervisional Stress S	admin dard Curve ometric Analysis ititative Analysis ics Analysis elength Scan -wavelength Analysis Protein Analysis	
MetaSpec Pro - [Photometric Analysis]		_ <b>_</b> ×
1 File System Device Operation View Window Help		- E ×
	8. 1	
🛧 Wavelength: 440.0nm 🛕 Abs: -0.0001 Tran:100.02% 🔝		Welcome!
No. Name Abs. Tran. Conc. Status	Measuring time	Remark
Photometric Analysis Settings (New) File attributes Parameters		
Company		
Wavelength 546	Number of samples 6	
Calculate the concentration	Concentration units ug/ml	
Linear fit through zero ()	K1 0.99	
Linear fit 🔘	ко о	
Quadratic fit 🔘	К2 0	
Cubic fit 🔘	КЗ 0	
	Confirm	n 🔀 Cancel
admin UV/Vis Connecting Ready Please set zero first	t	

2. Set parameters such as Wavelength, Number of samples and concentration calculating factors if choosing "Calculate the concentration". Then, confirm the settings by clicking the button

🗹 🖙 in the child window.

3. Put the Reference solution into the light path, click the shortcut icon 主 in the toolbar, the device will go to the operating wavelength first, then the system will calibrate the blank and

set to 0.000Abs/100.0%T.

- 4. Put the Sample solution into the light path, click the shortcut icon in the toolbar to start the measurement. The result containing Absorbance (Abs.) and Transmittance (Tran.) will be displayed in the data sheet. If the option of "Calculate the concentration" was chosen, the Concentration (Conc.) result will be displayed together. User can click the shortcut icon in the toolbar and measure more samples, the sample record also can be deleted by clicking the shortcut icon in the toolbar.
- 5. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test

data. The file will be saved in ". Pht" format. Click the shortcut icon 🕒 in the toolbar to

print the test report. The data also can be exported to Excel by clicking the shortcut icon in the toolbar.

5.3 Quantitative Analysis

Two methods can be chosen for quantitative analysis: Standard Curve method and Coefficient method.

1) Standard Curve method

About Standard curve, please refer to chapter 5.1. User can load the standard curve that has already been established and saved before, and measure samples with the same parameters.

2) Coefficient method

Coefficient method is a simple application of standard curve. Just choose the suitable calculation method and input the coefficient(s) of the equation in the parameter setting window, then begin the test.

- 5.3.1 Measurement for Quantitative Analysis
- 1. Select Quantitative Analysis in the Studio and click the shortcut icon D in the toolbar to set parameters and create a new quantitative analysis file. User also can double click Quantitative Analysis in the Studio directly to create a new file. There will be a child window for quantitative analysis settings.

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📕 MetaSpec Pro - [Quantitative Analysis]		_ 🗆 X
🔏 File System Device Operation View		_ <i>B</i> ×
Wavelength: 440.0nm 🛕 Abs: -0.0	001 Tran:100.03% E Welcome!	
No. Sample Name Status	Abs(635nm) results Measuring time Remark Calculation methods	
Quant	itative Analysis Settings (New)	
File at	ttributes Parameters Wavelength List	
	Company	
	Standard curve method	
	Linear fit through zero K1 0.98     Number of wavelength 1	
	Linear fit     K0     O     Number of samples     G     G     G	) 60 80 100 Incentration
	O Quadratic fit K2 0 Concentration units ug/ml	
	Cubic fit K3 0	er 1 Parameter 2 Remark
	Confirm Confirm	
admin UV/Vis Connecti		

2. In the child window, set parameters such as choosing Calculation method, number of wavelengths, setting Wavelength(s), Number of samples and selecting suitable Concentration

units. Load the standard curve by clicking the button 🔟 under the choice box if Standard

curve method was chosen as the calculation method. Otherwise, select the fitting method and set the factors.

3. Set up the wavelength(s) and calculation parameters in the window of Wavelength list: Click the setting bar and input the wavelength value when the cursor points to it, and press Enter key to confirm the setting. Set the calculation parameters with the same operations. User can click

the shortcut icon 🛃 and set up more wavelengths, the wavelength also can be deleted by

clicking the shortcut icon 🔀

Quantitative A	nalysis Settings	s (New)			×
File attributes	Parameters	Wavelength	List		
+×	Calculate fra	ction			
	aveLength Parar	meter 1 Param	eter 2 Remark		
	440.0	1	0		
				🔽 Confirm 🛛 🛃 C	ancel

Then, confirm the settings by clicking the button **Confirm** in the child window.

- Note: When Standard curve method was chosen, the parameter(s) of wavelength(s) has also been saved with the standard curve. So, user needn't set the wavelength(s) anymore.
- 4. Put the Reference solution into the light path, click the shortcut icon in the toolbar, the system will calibrate the blank and set to 0.000Abs/100.0%T at the operating wavelength.
- 5. Put the Sample solution into the light path and click the shortcut icon in the toolbar to start the measurement. The result containing Absorbance (Abs.) and Concentration (Conc.) will be displayed in the data sheet.

_	letaSpec Pro - [Quantitative A								
	File System Device Oper						_		_ 8 ×
#	••• 🗅 🗲 🗖 🗛 🛛	+ × 🕨	I 🛓 💔	¥ 🛠 🔍	Q 🔍 ቊ	1 🖡 📫 🍳 🖡	?		
4	Wavelength: 440.0nm 🛕	Abs: 0.3361	Tran:46.129	6				Welcome!	
No		Abs(440nm) R			Status	Measuring time	*	Standard curve Conc. = 0.0500 */	A Contraction of the second seco
	1 1#Sample	-0.0001	-0.0001		Measured	2013/8/16 16:09:15		1 1 1 1 1 1 1	
_	2 2#Sample	0.0320	0.0320		Measured	2013/8/16 16:09:24		0.9	
_	3 3#Sample 4 4#Sample	0.0668	0.0668		Measured Measured	2013/8/16 16:09:32 2013/8/16 16:09:40		0.8	
								0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	5 6 7 8 9 10 ncentration
								Parameter name	Parameter values
								Measurement method	Coefficient method
							Ξ	Calculation	Linear fit through zero
								K1	0.0500
								The number of wavelengths	1
								Concentration units	ug/ml
							•		
•						۱.			

6. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test

data. The file will be saved in "Qua" format. Click the shortcut icon

the test report. The data also can be exported to Excel by clicking the shortcut icon in the toolbar.

5.4 Kinetics Analysis

For Kinetics Analysis, user can view the variation tendency of a sample at a specific wavelength in a certain time range. Just do time scan with absorbance or transmittance mode. Time scan with concentration mode is also available by selecting the option of "Calculate the concentration".

- 5.4.1 Measurement for Kinetics Analysis
- 1. Select Kinetics Analysis in the Studio and click the shortcut icon D in the toolbar to set parameters and create a new kinetics analysis file. User also can double click Kinetics Analysis in the Studio directly to create a new file. There will be a child window for kinetics analysis settings.

	<ul> <li>✓ Studio_admin</li> <li>✓ Standard Curve</li> <li>1<sup>*</sup>≥ Photometric Analysis</li> <li>✓ Kinetics Analysis</li> <li>✓ Kinetics Analysis</li> <li>✓ Wavelength Scan</li> <li>Multi-wavelength Analysis</li> <li>✓ DNA/Protein Analysis</li> </ul>	
MetaSpec Pro - [Kinetics Analysis)	ion View Window Help	
	Abs: -0.0003 Tran:100.08%	Welcome!
2.79 2.48 2.17 1.86 0 1.55 1.55 1.24 0.33 0.62	Kinetics Analysis Settings (New)         File attributes       Parameters         Company       Concentration units ug/ml         Calculate the concentration       Concentration units ug/ml         Linear fit through zero       K1         Unear fit through zero       K1         Quadratic fit       K2         Quadratic fit       K2         Cubic fit       K3         Print Chart       Print Data	No. Time(s) Abs. Trans.(%) Conc Ren
0.31		

2. Set parameters such as Wavelength, Number of scanning, Interval(s), and concentration calculation factors if choosing "Calculate the concentration". Select the Display mode such as



Absorbance, Transmittance and Concentration. Then, confirm the settings by clicking the button in the child window.

- 3. Put the Reference solution into the light path, click the shortcut icon in the toolbar, the system will calibrate the blank and set to 0.000Abs/100.0%T at the operating wavelength.
- 4. Put the Sample solution into the light path and click the shortcut icon *in the toolbar to start time scanning.* There will be a real-time spectrum with chosen display mode in the graphics area and data containing Absorbance (Abs.) and Transmittance (Tran.) in the data sheet. When the scan is completed, there will be a dialog as following:

10	o completed, there will be a dialog as following	
ſ	MetaSpec Pro	
	The scan has completed!	
	ОК	

Click the button to exit the dialog. User can view the scanning result. If the option of "Calculate the concentration" was chosen, the Concentration (Conc.) result will also be displayed in the data sheet.

Wavelength: 500.0nm 🛓 Abs: -0.0001 Tran:100.02% 🛅 Welcome!	; <b>• </b> •	) 📽 🔲 🖴				1	🔆 🔍		•	I 🛶 🔍		ТС	<b>N?</b>				
No.         Time(s)         Abs.         Trans. (%)         Conc         Ref           100.5         100.4         157         157         0.000         100.0077         158         159         159         0.000         100.0038         159         159         0.000         199.9847         151         155         151         151         155         151         151         155         151         151         151         155         151         151         155         151         151         151         151         151						00 00	<u> </u>										
100.5       157       157       0.000       100.0077         100.4       100.3       158       158       0.000       100.0038         100.4       100.3       160	• Wave	length: 500.0nm	Ab	s: -0.000	1 Tran:1	00.02%						We	elcome!				
100.4 100.3 100.3 100.4 100.3 100.4 10	100.5 -											No.	Time(s)	Abs.	Trans.(%)	Conc	Remark
100.4         159         159         0.000         100.038           100.3         160         160         0.0001         99.9847           100.4         161         161         161         161         161         161         162         100.001         99.9847           100.1         100         162         162         163         163         0.001         99.9855           164         164         0.000         199.9555         164         164         0.000         100           100.1         100         165         165         0.000         100.0077         165         165         165         0.000         100.0077         166         166         0.000         100.0077         165         166         166         0.0001         199.9592         166         166         0.0001         199.9572         166         166         166         0.0001         199.9572         166         166         166         0.0001         199.9572         170         170         170         170         170         170         170         172         172         172         172         172         172         172         172         172         173         17	100.5											157	157	0.0000	100.0077		
100.3 100.2 100.1 100.2 100.1 100.1 100.2 100.4 10												158	158	-0.0001	100.0153		
100.3       161       161       0.001       99.9809         100.4       62       162       0.001       99.9673         100.4       64       164       0.000       100         100.4       64       164       164       0.000       99.9652         164       165       165       0.000       99.9662       165         165       165       0.000       100.0077       165       166       166       0.000       100.0077         165       166       0.000       100.001       99.9652       166       168       0.000       100.0077         166       166       0.0001       99.9732       167       167       0.001       99.9732         169       169       0.001       99.9772       171       171       100.01       99.9772         170       170       0.001       99.9772       172       172       0.0001       199.9372         171       171       10.001       99.9777       172       172       0.0001       100.0306       173         172       172       0.0001       100.0306       173       173       0.0001       100.0306         175       1	100.4 -											159	159	0.0000	100.0038		
100.2       162       162       0.001       99,9732         100.1       163       163       0.001       99,9555         164       164       0.000       100         100       105       165       0.0001       99,9562         166       166       166       0.000       100,0077         167       167       0.001       99,9592       166         168       0.0001       109,9572       166       165         166       166       0.0001       100,0077       165         167       167       0.0001       99,9592       166         168       0.0000       100,0077       155       168         169       169       0.0001       199,9732       170         170       170       0.0001       199,9732       170         170       170       0.0001       199,9772       172         170       170       0.0001       199,9772       172         172       173       173       0.0001       100,0077         174       174       0.0001       100,0077       175         175       175       0.0001       100,0153       175	- 1											160					
100.2         163         163         0.001         99.9655           100.1         165         166         0.000         100           100.1         165         165         166         0.000         100.115           100.1         165         165         166         0.000         100.017           100         165         166         0.000         100.0115           168         168         168         0.000         100.0115           169         169         169         0.0001         99.9772           170         170         0.000         100.0077         172           172         173         0.000         100.0077         172           171         171         0.000         100.0119         9.9732           172         172         0.0001         100.0077         172           172         173         0.0001         100.0077         172           172         173         0.0001         100.0077         172           173         173         0.0001         100.0077         172           173         173         0.0001         100.0077         172           173	100.3 -											161	161				
1001       164       164       0.000       100         1001       165       165       165       0.000       99.9962         100       165       165       166       0.000       100.0077         100       167       167       167       167       167         99.8       169       169       0.0001       99.9732       171       171       100.0101       99.9732         170       170       0.0001       100.0306       172       172       0.0001       100.0306         172       172       0.0001       100.0306       175       175       0.0001       100.0336         175       176       0.0001       100.0153       175       175       0.0001       100.0288         178       177       0.0001       100.0288       178       177       0.0001       100.0288         179       179       0.0001       100.0153       179       179       0.0001       100.0288																	
100.1         165         165         0.000         99.9962           100         100         166         166         0.000         100.0077           100         100         167         167         167         167         168         0.000         100.015           99.8         99.8         1171         1070         0.0001         99.9772         171         171         171         100.01         99.9772           99.8         99.7         172         172         0.0001         199.9772         172         173         173         0.0000         100.0077         174         174         0.0001         109.9772         175         175         175         0.0001         109.9772         175         175         175         0.0001         109.9809         175         175         0.0001         100.0376         175         175         175         175         175         175         175         175         175         175         175         175         175         175         175         176         176         176         176         178         178         178         178         178         178         178         178         178         178	100.2																
100.1       166       166       0.000       100.0077         100       167       167       0.001       99.9694         99.9       168       168       0.000       100.0115         169       169       0.0001       99.9732         171       170       0.0001       99.9772         172       172       0.0001       100.0077         173       173       0.0001       100.0077         174       174       0.0001       100.0077         175       175       0.0001       100.0077         176       176       0.0001       100.0077         175       175       0.0001       100.0153         176       176       0.0001       100.0288         178       178       0.0001       100.0288	1																
99.8         99.7         171         171         1000         100.0077           99.8         100         100         167         167         0.000         199.9694           99.8         100         167         167         0.000         199.9732           171         171         0.0001         99.9732         172         171         171         0.0001         99.9732           172         172         0.0001         199.9732         172         172         172         0.0001         199.9732           171         171         0.0001         199.9777         172         172         0.0001         199.9809           172         172         0.0001         199.9809         175         175         0.0001         199.9809           174         174         0.0001         100.0153         175         175         0.0001         100.0153           178         177         177         0.0001         100.0153         178         178         178         178         179         179         179         179         179         179         179         179         179         179         179         179         179         179         <	100.1											165					
99.9 99.8 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 99.7 172 172 0.0001 99.9772 172 172 0.0001 100.0306 173 173 0.000 100.077 174 174 0.0001 100.036 173 173 0.0001 99.9809 175 175 7 176 176 0.0001 99.9809 176 176 0.0001 99.9809 176 176 0.0001 99.9809 176 176 0.0001 100.0153 178 178 0.0001 100.0153 178 178 0.0001 100.0153 179 179 0.0000 100.0153 179 179 0.0000 99.9885																	
99.8       170       0.000       99.9732         99.8       171       171       0.0001       99.977         171       171       171       170       0.0001       99.9732         99.8       172       172       0.0001       100.0306         97.7       174       174       0.0001       100.0077         174       174       0.0001       100.0077         175       175       0.0001       99.9809         176       176       -0.0001       100.0153         99.6       176       176       -0.0001       100.0268         178       179       0.0000       99.9885       179       179       0.0000	at ta	M . Andre Mar.	h a	. Ann	AAA	المــــــــــــــــــــــــــــــــــــ	h h h	A LAA	. MA	A LAN							
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Time(s)	C	) 18	36	54			108	126	144	162	180	▶ 180	180	0.0000	100		

5. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test

data. The file will be saved in "KAT" format. Click the shortcut icon in the toolbar to print the test report. The data also can be exported to Excel by clicking the shortcut icon in the toolbar.

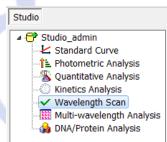
#### 5.5 Wavelength Scan

A curve of absorbance or transmittance in a certain wavelength range is available with wavelength scan. A curve of concentration is also available by selecting the option of "Calculate the concentration". User can do qualitative analysis such as to determine components of a simple sample by this function.

It provides users with more convenience. For example, peak(s) and valley(s) can be marked in a characteristic spectrum. Several spectrum curves can be scanned and shown in the same graph. User also can view 3D spectrogram if 3D setting is chosen as a graphics parameter.

5.5.1 Measurement for Wavelength Scan

1. Select Wavelength Scan in the Studio and click the shortcut icon in the toolbar to set parameters and create a new wavelength scan file. User also can double click Wavelength Scan in the Studio directly to create a new file. There will be a child window for wavelength scan settings.



📕 MetaSpec Pro - [Wavelength Scan]	1	_ <b>_</b> X
🚣 File System Device Operatio	on View Window Help	_ <i>8</i> ×
** ••• D 🗲 🛛 🖶 🕂	$\bullet \times \bullet = \pm 12 \% \% \% @ @ @ = $ $ = 0 @ A T C \aleph$	
🖶 Wavelength: 440.0nm 🛕 A	bs: -0.0002 Tran:100.04%	
0.005	Wavelength Scan Settings (New)	Peak/Valley Visible
0.004	File attributes         Parameters         Mark         P/V Threshold	
0.003	- Company	
0.002	Calculate the concentration Concentration units ug/ml	
0.001	Linear fit through zero K1 0.99 Display Mode Absorbance	
8	Linear fit  KO 0 Start wavelength 700	
φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεου φρεο φρεο φρεο φρεο φρεο φρεο φρεο φρεο	- Quadratic fit 🔘 K2 0 End wavelength 400	
뤽 -0.001	Cubic fit 🔘 K3 0 Wavelength Interval(nm) 1.0 🗸	
	Display Peak     Print Chart     Scan Times     1	
-0.002	- 📝 Display Valley 📄 Print Data	
-0.003	Confirm 🔀 Cancel	
-0.004		
-0.005		
390 468	546 624 702 780 858 936 1,014 1,092 Wavelength(nm) Scan Data Peak and Valley Data	4
admin UV/Vis C	Connecting Ready Please set zero first	

2. Set parameters such as Start wavelength, End wavelength, Wavelength Interval(nm), Scan Times and concentration calculating factors if choosing "Calculate the concentration", select



the Display mode such as Absorbance, Transmittance and Concentration. Then, confirm the settings by clicking the button *Confirm* in the child window.

3. Put the Reference solution into the light path, click the shortcut icon 🔳 in the toolbar, it will

pop up a dialog, click the button **start**, the system will calibrate the baseline in the setting wavelength range.

User Baseline			X
Quit Start	Stop		
No. WaveLength	Energy	Gain	

After the baseline calibration is completed, it will show a dialog as following:

MetaSpec Pro		 ×
Baseline has l	oeen established!	
		ОК

Click the button **Click** the dialog.

4. Put the Sample solution into the light path, click the shortcut icon 🕨 in the toolbar to start

wavelength scanning. There will be a real-time spectrum with chosen display mode in the graphics area and data containing Wavelength, and Absorbance (Abs.) or Transmittance (Tran.) in the data sheet. When the scan is completed, there will be a dialog as following:

MetaSpec Pro	
The scan has completed!	
The sear has completed:	
	ОК

Click the button **C** to exit the dialog. User can view the scanning result. If the option of "Calculate the concentration" was chosen, the Concentration (Conc.) result also can be displayed in the data sheet.



. <u> </u>		Operation Vie		Help									- é
5 <b>*   *</b>	28			<b>118</b> 😵 😵		•			С	<b>\?</b>			
• Wavele	ngth: 400.0nm	<u> </u> Abs: -0.0	0003 Tran:1	.00.06%					Weld	:ome!			
0.003 -								_ []	No.	Wavelength	Abs	Peak/Valley	Visible
									279	422.0	-0.0001	-	No
0.0024 -									280	421.0	-0.0003	-	No
0.0024 -									281	420.0	-0.0001	-	No
									282	419.0	0.0000		No
0.0018 -		1							283	418.0	0.0000		No
1									284	417.0	0.0000		No
0.0012 -		+			····r				285	416.0	-0.0002		No
1									286	415.0	-0.0004		No
0.0006 -									287	414.0	-0.0001		No
8		. h			1.11				288	413.0	-0.0001		No
Absorbance	M And	Willow	LIMA	14.1. A. A	JANE	. Miller	mr. Mr. M.		289	412.0	0.0000		No
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	17 Y W		1 - T	1 1					291	410.0	-0.0001		No
-0.0006 -									292	409.0	0.0001		No
1									293	408.0	0.0001		No
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									300	402.0	-0.0002		No
-0.003									300	400.0	-0.0002		-
-0.003 -	420 4	50 480	510	540 57	006 0	630	660 69		301	400.0	0.0002		
				avelength(nm)				•		Peak and Valley [			

5. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test

data. The file will be saved in "WLS" format. Click the shortcut icon 🕒 in the toolbar to

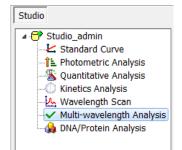
print the test report. The data also can be exported to Excel by clicking the shortcut icon in the toolbar.

5.6 Multi-wavelength Analysis

Absorbance at several wavelengths can be quickly obtained with multi-wavelength Analysis, and the Result (Abs.) will be calculated at the same time. User also can-do quantitative analysis with this function.

- 5.6.1 Measurement for Multi-wavelength Analysis
- 1. Select Multi-wavelength Analysis in the Studio and click the shortcut icon D in the toolbar

to set parameters and create a new multi-wavelength analysis file. User also can double click Multi-wavelength Analysis in the Studio directly to create a new file. There will be a child window for multi-wavelength analysis settings.



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🚬 MetaSpec Pro - [Multi-wavelength	Analysis]		_ <b>_</b> ×
File System Device Operation			- 8 ×
	× • • ± 🕅 🕸 🖗 Q Q Q	] <b>k?</b>	
🔹 Wavelength: 400.0nm 🛕 Ab	bs: -0.0001 Tran:100.03%	Welcome!	
No. Sample Name Stat	tus Abs(400nm) Abs(500nm) Abs(600nm)	results Measuring time Remark	
	Multi-wavelength Analysis Settings (New)	×	
	File attributes Parameters Wavelength List		
	Company		
	Standard curve		
	Number of samples 6	Number of wl 3	
	Calculate the concentration	Unit ug/ml	
	O Linear fit through zero	K1 0.0649	
	C Linear fit	ко о	
	O Quadratic fit	к2 0	
	Cubic fit	кз 0	
		Confirm Cancel	
	<u>(</u>		
admin UV/Vis Co	onnecting Ready Please set zero first		

2. In the child window, set parameters such as Number of wavelength and Number of samples.

If quantitative analysis with this function will be done, the option of "Calculate the concentration" should be chosen. Load the standard curve by clicking the button index the choice box when Standard curve method was chosen as the calculation method. If Coefficient was chosen as the calculation method, select the fitting method and set the factors.

3. Set up the wavelength(s) and calculation parameters in the window of Wavelength list: Click the setting bar and input the wavelength value when the cursor points to it, and press Enter key to confirm the setting. Set the calculation parameters with the same operations. User can click

the shortcut icon 庄 and set up more wavelengths, the wavelength also can be deleted by

clicking the shortcut icon 🔀

 No.	WaveLength	Parameter 1 P	Parameter 2 Remark	<b>^</b>
1	400.0	1	0	
2	500.0	1	0	

Then, confirm the settings by clicking the button **Confirm** in the child window.

- Note: When doing quantitative analysis with the function of Multi-wavelength Analysis, and Standard curve method was chosen, the parameter(s) of wavelength(s) has also been saved with the standard curve. So, user needn't set the wavelength(s) anymore.
- 4. Put the Reference solution into the light path, click the shortcut icon into the toolbar, the system will calibrate the blank and set to 0.000Abs/100.0%T at each setting wavelength.
- 5. Put the Sample solution into the light path, click the shortcut icon in the toolbar to start the measurement. Absorbance (Abs.) at each wavelength and the Result (Abs) will be displayed in the data sheet. If the option of "Calculate the concentration" was chosen, the Result (Conc.) will be displayed together. User can click the shortcut icon in the toolbar and measure more samples, the sample record also can be deleted by clicking the shortcut icon in the toolbar.
- 6. After the measurement is completed, click the shortcut icon 💷 in the toolbar to save the test data. The file will be saved in "MWL" format. Click the shortcut icon 🝙 in the toolbar to print the test report. The data also can be exported to Excel by clicking the shortcut icon 🔊 in the toolbar.
- 5.7 DNA/Protein Analysis

Quantitative analysis and purity test for DNA and protein is available with DNA/Protein Analysis. There are three Calculation methods for choosing: Method one, Method two, and Custom method. The concentration of DNA and protein and the ratio result depend on the chosen calculation method.

- 5.7.1 Measurement for DNA/Protein Analysis
- 1. Select DNA/Protein Analysis in the Studio and click the shortcut icon Di in the toolbar to set parameters and create a new DNA/Protein analysis file. User also can double click DNA/Protein Analysis in the Studio directly to create a new file. There will be a child window for DNA/Protein analysis settings.

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Studio
▲
🚽 🗠 Standard Curve
Photometric Analysis
- 🕖 Kinetics Analysis
🖳 🏡 Wavelength Scan
Multi-wavelength Analysis
✓ DNA/Protein Analysis

KetaSpec Pro - [DNA/Protein Analysis]						ı x
🙀 File System Device Operation View Window H	əlp					- 8 ×
	** 9.0.0	R N?				
掛 Wavelength: 400.0nm 🛕 Abs: 0.0000 Tran: 100.	01%		Wel	come!		
No. Name Abs(260.0nm) Abs(28	0.0nm) Abs(320.0nm)	DNA Conc. Prote	ein Conc. Ratio	Status	Measuring time	Rema
DNA/Protein Analysis S	ettings (New)			×		
File attributes Paramet	ers					
C -(Abr	Abr )	E1 (Abc. A	ha NES			
		F1-(Abs <sub>l2</sub> -A ×F3-(Abs <sub>l1</sub> -/				
C <sub>Protein</sub> -(AD	$s_{\lambda_2} - ADs_{\lambda r}$	$13-(ADS_{1})$	λr )×r 4			
Company	Default Company Name					
Calculation methods	Method One 🔹	Number of samples 6				
Concentration units	ug/ml 👻	F1= 62.9	9			
Wavelength 1	260.0	F2= 36				
Wavelength 2	280.0	F3= 155	2			
Ref Wavelength 📝	320.0	F4= 757	.3			
		Confir	m 🔀 Cancel			
	DI					+
admin UV/Vis Connecting Ready	Please set zero firs	t				.::

- Select the Calculation methods, Concentration units and choose whether calibrating with "Ref Wavelength" or not. Input the wavelengths and calculation factors if the Custom method is chosen. Then, set the Number of samples and confirm the settings by clicking Confirm button in the child window.
- 3. Put the Reference solution into the light path, click the shortcut icon in the toolbar, the system will calibrate the blank and set to 0.000Abs/100.0%T at each setting wavelength.
- 4. Put the Sample solution into the light path, click the shortcut icon in the toolbar to start the measurement. Absorbance (Abs.) at each wavelength, the concentration of DNA (DNA Conc.), the concentration of protein (Protein Conc.), and the ratio will be displayed in the data sheet. User can click the shortcut icon in the toolbar and measure more samples, the sample record also can be deleted by clicking the shortcut icon in the toolbar.
- 5. After the measurement is completed, click the shortcut icon 🔲 in the toolbar to save the test

data. The file will be saved in "DNA" format. Click the shortcut icon 🗈 in the toolbar to print the test report. The data also can be exported to Excel by clicking the shortcut icon 📧 in the toolbar.

