## Lambda 465 Rapid Mixing Accessory with Pneumatic Drive Installation Instructions

This instruction sheet describes the installation of this accessory which is used with the Lambda 465 Spectrophotometer.

NOTE: Read these instructions before you install this accessory.

### Contacting PerkinElmer

Supplies, replacement parts, and accessories can be ordered directly from PerkinElmer, using the part numbers.

See our website:

http://perkinelmer.com

PerkinElmer's catalog service offers a full selection of high-quality supplies.

To place an order for supplies and many replacement parts, request a free catalog, or ask for information:

If you are located within the U.S., call toll free 1-800-762-4000, 8 a.m. to 8 p.m. EST. Your order will be shipped promptly, usually within 24 hours.

If you are located outside of the U.S., call your local PerkinElmer sales or service office.

### Features

- The rate constants define the reaction kinetics
- Easy to mix two liquid sample
- Mixing rate-controllable by press drive
- Simultaneously measure right after injection



Figure 1 Lambda 465 Rapid Mix Accessory with the Pneumatic Drive [P/N: N4104015]

# Dimensions and Specifications

Physical Characteristic		Specification		
Rapid Mixing Accessory Only	Dimensions (mm)	70 (H) x 250 (W) x 150 (D)		
Rapid Mixing Accessory	Dimensions (mm)	85 (H) x 455 (W) x 150 (D)		
with Pneumatic Drive	Weight (kg)	4.62		
Dead	Time	8 ms		
Optical P	athlength	2 mm and 10 mm for absorbance/fluorescence/circular dichroism		
Wido	w Size	40 mm <sup>2</sup> for fluorescence detection		
Cell M	laterial	Silica		
Beam	Height	15 mm from base of cuvette holder		
Minimum	Vol./Shot	120 µl/Shot for each reactant		
Syringe	Volume	2.5 ml		
Ratio	mixing	1:1 as standard, but different ratio is also available by altering syringes (up to 1:10)		
Temperat	ure Range	4 to 60°C		
Trigo	gering	TTL, open-collector and switch-contact		
Flow Circuit		Biocompatible and chemically inert		

### Description

Configuration of the Rapid Mixing Accessory with Pneumatic Drive



Digital temperature meter switch



**Connection cable** 





Figure 2 Lambd 465 Rapid Mixing Accessory and interface cables

### Installation

1. Connect the connection cable with Rapid Mixing Accessory and Lambda 465 as shown below.



#### Figure 3 Connections

- 2. Place the Micro Cell which is connected with Rapid Mixing Accessory into the cell holder of Lambda 465.
- 3. Connect the power cord and USB cables between USB (1) & USB (2) and the PC.
  - \* USB (1) Port of Lambda 465: Connected to the PC for communication
  - \* USB (2) Port of Lambda 465: Connected to the PC which is related to triggering the signal to the Rapid mix accessory.



Figure 4 Connections

4. Turn on the power of the Lambda 465.

5. Connect the reinforced hose line to air or N<sub>2</sub> gas supplier and open the pressure regulator entirely by turning it counterclockwise. And then open the gas valve of supplier to push gas into the pneumatic drive.



Figure 5 Connecting the reinforced hose

#### Installing the Driver

When using the rapid mix accessory, install the COM port drive properly according to the following procedure.

- 1. Turn on the computer and the Lambda 465.
- 2. Connect the two USB cables between the computer and the Lambda 465.
- 3. Select C>UV Lab> USB Drivers> Lambda 465> USB2 folder.
- 4. Double click USBCom-CDM\_20828.



5. Click Extract.



6. Click Next.



7. The following dialog box will appear. After installation is completed successfully, click **Finish**.



8. Select My Computer  $\rightarrow$  Properties.



- -0-----• 49 Search Caribol Farrel Color 🕫 • Centrel Panel • System and Security • System р . Control Panel Home View basic information about your computer 🚱 Device Manager Windows edition S Namote settings Windows 7 Ultimate System protection Copyright © 2009 Microsoft Corporation, All rights reserved. System Rating 240 Windows Experience Index Processor: Intel(R) Core(TM) (5-2310 CPU @ 2.90GHz 2.90 GHz Initalled memory (RAM): 4.00 GB (2.95 GB usable) 32-bit Operating System System type: Pen and Touch: No Pen or Touch Input is available for this Display Computer name, domain, and workgroup settings -Computer name: TEST-PC Grange settings Full computer name: TEST-PC Computer description WORKGROUP Workgroup: Windows activation Nou must activate today. Activate Windows now Product ID: 00426-292-0000007-85613 Change product key See also Action Center Windows Update Performance Information and
- 9. Select on Device Manager.

 Select the Ports (COM & LPT) to expand the listing. These are the devices currently connected to the COM ports. The USB Serial Port (COMx) is visible when the driver installation is completed successfully.



11. Double click on USB Serial Port (COMx) of the Ports (COM & LPT) section.



12. Select on the **Port Settings** tab and click on the **Advanced... button**.

USB Serial Port (COM4) Properties
Genera Port Settings Driver Details
<u>B</u> ts per second: 9600 ▼
Data bits: 8
Parity: None
Stop bits: 1
Elow control: None
Advanced Bestore Defaults
OK Cancel

13. Change the parameter values as shown below.

Advanced Settings for COM4	8
COM Port Number: COM4  USB Transfer Sizes Select lower settings to correct performance problems at low baud rates. Select higher settings for faster performance. Receive (Bytes): Transmit (Bytes):	OK Cancel Qefaults
BM Options Miscellaneous Options	
Select lower settings to correct response problems. 5 verator	V
Latency Timer (msec): 16 - Z senar Printer	
Cancel If Power Off	
Timeouts 500 urprise Removal	
Minimum Read Timeout (msec):	
Minimum Write Timeout (msec):	

14. Select **OK** after checking the changed parameter values.

Advanced Settings for COM4		? 💌
COM Port Number: COM4 USB Transfer Sizes Select lower settings to correct performance problems at k	• ow baud rates.	OK Cancel
Select higher settings for faster performance. Receive (Bytes): 1024 • Transmit (Bytes): 1024 •	]	Defaults
BM Options Select lower settings to correct response problems. Latency Timer (msec): 5 -	Miscellaneous Options Serial Enumerator Serial Printer Cancel If Power Off	7
Timeouts Minimum Read Timeout (msec): 500 Minimum Write Timeout (msec): 500	Event On Surprise Removal Set RTS On Close Disable Modem Ctrl At Startup	

- 15. Launch the software.
- 16. If the instrument fails to communicate with the PC, change the COM Port Number as shown in the following steps.

- 17. Open Advanced Setting for COMx window following steps 8 to14.
- 18. Select on the COM Port number list to expand it and change the COM port number another one which is not in use from COM 1 to COM 10.

COM Port Number:	COM4	-		OK
USB Transfer Sizes	COM1 COM2	<u>^</u>	1	Cancel
	COM2 (nume)			Carlos
Select lower settings to con	COM4	=	d rates.	
				Defaults
Select higher settings for fa	S COM6			
	COM7			
Receive (Bytes):	COM8			
	COM9			
Transmit (Bytes):	COM10			
	COM11			
	COM12			
BM Options	COM13		Miscellaneous Options	
	COM14		rescent resus options	
Select lower settings to cor	COM15 COM16		Serial Enumerator	V
	COM15 COM17			12.0
	COM18		Serial Printer	10
Latency Timer (msec):	COM19		Contraction and the second	100
	COM20		Cancel If Power Off	10
Timeouts	COM21			
	COM22		Event On Surprise Removal	10
	COM23			
Minimum Read Timeout (ms			Set RTS On Close	10
	COM25		Disable Made a Children Children	
Minimum Write Timeout (ms	e COM26		Disable Modem Ctrl At Startup	
	COM27			
	COM28			
	COM29			
	COM30	1.0		

19. Make sure that the changed COM Port Number is applied and select **OK**.

COM Dealth and an		_	
COM Port Number: COM2		<u> </u>	OK
USB Transfer Sizes			Cancel
Select lower settings to correct perform	nance problems at lov	v baud rates.	- Dafe da
Select higher settings for faster perfor	mance.		Defaults
Receive (Bytes):	1024 🔻		
necerie (oyica).	1024		
Transmit (Bytes):	1024 🔻		
BM Options		Miscellaneous Options	
Select lower settings to correct respon	se problems.	Serial Enumerator	6
Latency Timer (msec):	5 👻	Serial Printer	1
		Cancel If Power Off	E
Timeouts		Event On Surprise Removal	E
Minimum Read Timeout (msec):	500 -	Set RTS On Close	1
Minimum Write Timeout (msec):	500 -	Disable Modem Ctrl At Startup	0

20. Restart the computer after finishing driver setting.

### Measurement

NOTE: Start the sample measurement after more than 20 minutes warming-up of system.

This accessory can be operated in Time Based Kinetics and the Ultra Kinetics functions of Kinetics mode and the Enzyme Activity function in Bio mode.

#### Blank Measurement

1. Launch the **UV Lab** software. When the window below is appeared, select **Experiment Type** and select **OK**.

S New			×
Title	Untitled-1		<u>0</u> K
Comment			Cancel
Sample Name	Sample		
Experiment Type	Time Based Kinetics	•	

2. The following dialog box will be displayed. Enter each parameter and select **OK**.

S Method - C:#UV Lab#Default.mtd					
Experiment Type: Time Based Kinetics 🖉 Open 📱 Save					
Experiment Setup	*				
Data Type	Absorbance -				
Sampling	Single Cell Peltier				
Mode	Single Cell Holder				
Sean No.	8 Multi-Cell Holder				
Integration No.	Reflectance Module				
Baseline Correction Auto Sampler					
Time Based Kinetics Rapid-Mix					
Time Unit External Trigger					
/ Interval Time	Single Cell Peltier				
Total Run Time	60				
Initial Delay Time	0				
Rate Calculation Type	Zero Order 🔹				
Rate Calculation Start Time 0					
Rate Calculation End Time 60					
"Ø Kinetics Wavelength Range					
<b>.</b>					
Save as Default OK Cancel					

3. Click the **red-marked icon (pencil icon)** when you want to change any parameters for the Rapid-Mix.

VV Lab - [Untitled-1]							x
🕒 🔁 Eile Edit Measure	⊻iew Mat <u>h</u> Window Help	1997 - C				- 14	e x
Wave Scan Quantific:		1.9		UV ON VIS O	14	Y Auto	× Set
3-	Experiment Setup	1					
(Tr) examples (Tr) (Tr) (Tr) (Tr) (Tr) (Tr) (Tr) (Tr)	Accessory Type Baseline Correction Mode F Scan No. 1 Integration No. 1	Papid-Mix     Referencing Stage     Auto Sampler     Rapid-M     Single Cell Petitier     Fiber Module     Mutit-Cell Petitier     Fiber Module     50	<ul> <li>✓</li> <li>✓</li></ul>	- um Li	Waveleng	700 800 900 1000 110 hh (um) Mode   Sca   Inte	*
Experiment Type: Time Base	Time (Sec)			Experiment Method J Accessory Typ Baseline Com Mode Scan No. Integration No	per ut mid rection I Faster 10 1		•

4. The following dialog box will appear. Then, choose **Yes** for using Rapid-Mix and enter the COM port number of which the Interface Module is connected to the PC.

SRapid-Mix		×
Rapid-Mix Setting		Port Find
Using Rapid-Mix	Yes	ОК
COM Port No.	1	
		-

- 5. Fill the blank material (solvent, water, etc.) into Syringe 1 and Syringe 2. Syringe 3 is used for draining the mixed blank reagent after blank measurement.
- 6. Place the position of circle valve as shown below.



Figure 6 Location of the circle valve

7. After placing reagent control valve of Syringe 1 and Syringe 2 at the LOAD position, push syringes 1 and 2 simultaneously to load the blank reagents. After loading, place the valves to the DRIVE position.



Figure 7 Syringes into the reactant

8. Place the position of circle valve as shown below.



Figure 8 Location of the circle valve

9. Charge the gas by closing regulator (turning clockwise) until the pressure is set as desired (3 to 4 bar, 45 to 60 psi).



Figure 9 Controlling the gas pressure by closing the regulator

10. Press the **Drive** button and keep pressing until the Actuator piston pushes the Push block entirely.



Figure 10 Location of Push block and Actuator piston

- **Note 1:** In the blank measurement, even the stop syringe will tap the trigger switch, the blank is not measured automatically. You should click measure Blank in the software.
- **Note 2:** Be careful **not** to contact the trigger switch after the Blank measurement. If the trigger switch is contacted, the Rapid Mixing will transfer the sampling signal to the software and automatically UV Lab software will measure the sample even though the sample is not loaded.
  - 11. When the Actuator piston finishes pressing the Push block, the mixed blank reagent is injected to the cuvette cell to measure blank and then the stop syringe will tap the Trigger switch.



Figure 11 Trigger Switch

12. Click **Blank** in the software and then the Blank will be measured.

13. After the measurement, place the position of circle valve as shown in the following figure and then drain the mixed blank reagent to the syringe 3.



Figure 12 Position of the circle valve

#### Sample Measurement

1. Fill the samples into syringe 1 and syringe 2. Syringe 3 is used for draining the mixed sample solution after sample measurement.



Figure 13 Filling the syringes

2. Place the position of circle valve as shown in the following figure.



Figure 14 Position of the circle valve

3. Place the Reagent control valves of Syringe 1 and Syringe 2 to the LOAD direction. And then, push the Syringe 1 and 2 simultaneously to load the samples.



Figure 15 Loading the samples simultaneously

4. Place the reagent control valves into the DRIVE direction.



Figure 16 Placing the Reagent control valves into the DRIVE direction

5. Place the position of circle valve as shown below.



Figure 17 Position of the circle valve

6. Charge the gas by closing regulator (turning clockwise) until the pressure is set as desired (3 to 4 bar, 45 to 60 psi).



Figure 18 Charging the gas by closing regulator

7. Press the Drive button and keep pressing until the Actuator piston pushes the Push block entirely.



Figure 19 Pressing the Drive button

8. When the Actuator piston finished pressing the Push block, the mixed sample solution is injected to the cuvette cell to measure sample and then the Stop syringe will tap the Trigger switch.



Figure 20 Pressing the Actuator piston

- 9. After the trigger switch is tapped, the sample will be measured automatically.
- 10. After the measurement, place the position of circle valve as shown below, and then press the piston of stop syringe to drain the sample solution to syringe 3.



Figure 21 Pressing the piston

### Troubleshooting

### When sample is not injected from Syringe 1 or 2

- 1. Check whether the reagent control valve is correctly directed.
- 2. Check the sample is already fully injected.
- 3. Make sure that the circle valve direct is rotated correctly.

#### When Actuator piston does not move

- 1. Check the gas is charged sufficiently.
- 2. Check whether the Push block is hooked by some distrubing particles.

#### When sample is not drained to Syringe 3

> Make sure that the circle valve is rotated to the correct direction.

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