



Quick Start Guide for cellSens Dimension

IQS002- Rev 06

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1 Integrated CoolLED Products:

Please note compatibility with cellSens packages below:

CoolLED Illumination System	cellSens Dimension	cellSens Standard
pE-800 Series	1	
(pE-800 and pE-800 ^{fura})	v	
pE-4000	✓	
pE-300 ^{white} , pE-300 ^{ultra}	✓	✓
pE-340 ^{fura}	\checkmark	\checkmark
pE-2	\checkmark	

2 Setting up your CoolLED Illumination System COM Port via USB:

If using the pE-800 Series and Windows 10, please move directly to Section 3, since the pE-Driver is not required (Windows automatically detects the hardware and installs the driver).

For Windows versions pre-dating Windows 10, or if using any other compatible Illumination System, the CoolLED pE-Driver is required and the PC configured as follows:

1. Download the CoolLED pE Driver file from the CoolLED website:

https://www.coolled.com/support/imaging-software/#coolled-pe-driver

N.B. This is a general driver for Windows and all USB controlled CoolLED Illumination Systems, and the pE-800 Series when using Windows operating systems earlier than Windows 10.







- 2. Save the files to a memorable location.
- 3. Connect the CoolLED Illumination System. When the driver required warning (yellow exclamation mark) appears, right click and 'update' the driver, pointing it to the .inf file in the previously downloaded driver folder.
- Check the Virtual COM ports assigned by navigating to Device Manager (Start -> Control Panel
 -> System Management -> System -> Hardware -> Device Manager). The CoolLED Illumination
 System should be listed under 'Ports' (COM & LPT):



Figure 1: Device Manager with pE-4000 installed

Either COM port may be used for control. The creation of two COM ports is to allow for multiple uses (for example: one could be used for controlling the CoolLED Illumination System whilst the other is used for command testing).

3 Installing your CoolLED Illumination System in cellSens

 During installation and setup of your configuration, when the 'Microscope Accessories Selection' screen appears (Figure 2), locate CoolLED in the list and select relevant Illumination System(s).







OLYMPUS cellSens Dimension 4.2 (build	d 28604) Se	etup	×
Microscope Accessories Selection	1		
Choose microscope accessories			OLYMPUS
Choose the manufacturer of the micros Then choose the device from the right	cope acces list.	sory from the left list.	
Manufacturer		Device	
Olympus Applied Scientific Instruments	^	□pE-300 ultra	
CoolLED		□pE-300 white	
Excelitas		□pE-340 fura	
Ludi Electronic Products			
Märzhäuser			
National Instruments			
Sutter Instrument	~		
InstallShield			
		< Back Ne	ext > Cancel

Figure 2: CoolLED devices listed in 'Microscope Accessories Selection'

4 Configuring your CoolLED Illumination System in cellSens

1. From the cellSens start up screen, navigate to the 'Device List'.

Device List		? ×
Configuration:	Default 📑 📲 abl 🔀	
Microscope Frame:	IX53 P1F	
Camera Microscop	e Reflected light path Transmitted light path Simulators	
<u>L</u> amp:	pE-800 Connector:	
Filter <u>w</u> heel:	Device not used • +	
Sh <u>u</u> tter:	pE-800 virtual shutter 🔹 🔹	
Shutter triggered by:		
	OK Cancel Inte	rfaces
	Figure 3: 'Device List'	

2. In the 'Lamp' dropdown, select the CoolLED Illumination System (in this example pE-800) and in the 'Shutter' dropdown select the 'Virtual Shutter'.







 On the same screen, click on 'Interfaces' (red box, Figure 3). If you have followed the steps in Section 2, assign the COM port identified here. If using the pE-800 or pE-800^{fura} with Microsoft Windows 10 or later, this will be automatically assigned.

I	Interfaces ? ×						
	Serial Port Parallel Port Ethernet						
	Interface	Description	Device				
	COM8	USB Serial Device	CoolLED_pE-800				



4. Return to the Start screen and click 'Device Settings'. The Illumination System and shutter will now appear as below to be used in the customisation menu:



5 Examples of Software Functionality

5.1 Microscope Control (Manual)

Manual control of LED selection and intensity is achieved by using the 'Microscope Control' menu.

1. Navigate to 'Microscope Control' in the tool bar.

OLYMPUS cellSens Dimension			
File Edit View Acquire Process	Tools Window Help		Acquisition
🛬 • 😂 • 🗐 🐺 🐗 🗈 X 🐴	應 語 이 • 이 • 🗃 🕅 👷 🖤 역 티, 🛌 디어크 🧸 🖓 📮 🕴 🖉 💶 📜 🕵 Reflected	📶 😻 D	api 🐧 Fitc 🐧 Tritc 💐 Cy5
Camera Control 🛛 ? 🕈 🗙	4 💽 Start Page 🗙 🧟 Experiment 🗙	re Mi	icroscope Control
📓 💷 • 🕾 🚺 🖾 🖓 🔛 🍹			
6	CLYMPUS cellSens Dimension	wi	ndow
Live Snapshot	Help & Support Configure System		

Figure 6: Navigating to the 'Microscope Control' window from the toolbar (red box)

2. This opens the 'Microscope Control' window:







Microscope Control	? 7 X		
£ \$			
Objectives (Objective 1)	^		
Shutters	<u> </u>		Open or close global shutter
Reflected	Open		
Observation Methods	•		
DAPI FITC TRITC Cy5			Select your configured
Device Units	<u> </u>		'Observation Methods' (see
🎄 Manual Mirror Turret			Section 5.2)
рЕ-800			
365 nm — —	- + 21 %		
435 nm —	- + 61 %		control selection and intensity of individual LEDs
470 nm — —	- + 27 %		
500 nm 🗕 —	- + 43 %		
740 nm 🗕 —	- + 47 %		
635 nm — —	- + 47 %		
580 nm —	- + 47 %		
550 nm —	+ 54 %		
Device Info			
Manual Nosepiece Manual Mirror Turret			
🛃 Experi 🚺 Process 😥 Micros	sc 💾 Adjust		
Figure 7: 'Microscope Co	ontrol'	_	

Note:

• If using the pE-4000, it is not currently possible to achieve 'in-bank' switching: This means that it is not possible to use the USB to switch between wavelengths in the same pE-4000 channel (Such as 365 nm & 385 nm, or 460 nm & 500 nm).

5.2 Observation Methods

'Observation Methods' can be configured to allow quick access to frequently used LED settings. For example, the following steps show how to create an Observation Method for a few popular fluorophores.

1. Navigate to 'Device Customization' on the Start Page or the toolbar.







Figure 8: 'Device Customization' accessed either from Start Page (left, red box), or Toolbar (right, red box)

2. In the 'Device Customization' window, create and name new 'Observation Method' by clicking the icon in the top left corner (see Figure 9, red box), and enter a new name.







Device Customization					? ×
Observation Methods Softkeys					
Observation Method				Selected components	
🕌 🔀 abl 🐚 🛍 ី 🗒				■ 🤗 pE-800	Use
Name: DAPI					21 % Off
	Type:	Undefined	•	🦕 470 nm	Off
Use calibration of observation met			-		Off
Available components					Off
Fluorochromes	Status: A	djust	•	🤶 580 nm	Off
🦾 Camera	All objectives			👷 550 nm	0 11
Camera Simulator #1		·			
Manual Nosepiece	Adjust on/off	only			
🎄 Manual Mirror Turret					
Fluorescence/reflected	ter a New Observat	ion Method Name		×	
PE-800 <u>N</u> a	ime: TR	атс			
pE-800 virtual shutter			ОК	Cancel	
	500 nm —				
	740 nm —				
	635 nm				
	580 nm —				
	550 nm				
					OK Carcol
					Calicer

Figure 9: Creating and naming a new 'Observation Method' in the 'Device Customization' window

- 3. Assign the fluorochrome by selecting 'Fluorochrome' (blue box in Figure 10), selecting the relevant fluorochrome from the list.
- 4. Return to the 'Device Customization' window to configure the LED selection and intensity. First select the CoolLED Illumination System from 'Available components', and change status to "Adjust". It is now possible to select the desired LED(s) and intensity, which in this example for TRITC is the 550 nm LED at 30%.







Device Customization						? ×
Observation Methods Softkeys	<u>`</u>					
Observation Method					Selected components	
🌞 🗙 abl ⊾ 證 🔡					■ 💡 рЕ-800	Use
Name: TRITC	• <u>G</u> roup:			•	9 365 nm	Off
	Type:	Undef	ined	•	435 nm	Off
				•	500 nm	Off
Augusta a succession and a						Off
AV2	Charles and	Adjuct			635 nm	Off
	Status:	Aujusi			9 580 nm	0ff 30 %
Camera	All object	ives				
Camera Simulator						
Manual Noconioco	Adjust	on/off only				
Manual Mirror Turret						
+ Fluorescence/reflected	365 nm	ı — t				
P pE-800	435 nm					
S pE-800 virtual shutter						
	470 nm					
	500 nm					
	740 nm	ı — 1				
	635 nm	ı — 1				
	580 nm					
	550 nm		30 %			
					OK	Cancel

Figure 10: Configuring the new 'Observation Method' by selecting Fluorochrome (blue box) and adjusting LED selection and intensity

Note:

- There is no requirement to select 'Adjust on/off only
- The pE-4000 Illumination System has four channels with four LEDs within each bank. This is shown as a dropdown menu where one of the four LEDs can be selected per channel.







Device Customization	?	\times				
Observation Methods						
Device Customization	? 345/4 25	× ISS Jse 5 % Off Off				

Figure 11: The pE-4000 has a dropdown to select one of four LEDs per channel

5. Configure the shutter: the shutter can be used as 'use for acquisition', which means that the LED(s) will be switched on when the camera is in live mode or when acquiring an image, but switched off when not acquiring. This is useful in several ways, such as protecting samples with reduced risk of phototoxicity and photobleaching.

Device Customization					?	×
Observation Methods Softkeys						
Observation Method				Selected components		
🌟 🗙 abl 🗞 💒 🔡				■ 🌳 pE-800		Use
<u> </u>	- <u>G</u> roup:		-	🧛 365 nm		Off
						Off
	туре:	Underined		470 nm		Off
Use calibration of observation metho			-	🚽 💡 500 nm		Off
Augusta a supervisional and				🚽 🖓 740 nm		Off
Available components				💡 635 nm		Off
Fluorochromes	Status:	Not changed	•	💮 🍚 💡 580 nm		Off
🎼 Camera		Not changed		🔤 💮 😴 550 nm		30 %
Camera Simulator	All objective	Use for acquisition				
🕂 General						
Manual Noseniece						
Annual Mirror Turret						
Huorescence/reflected						
PE-800						
🍏 pE-800 virtual shutter						

Figure 12: 'Device Customization', configuring the shutter







6. It is possible to set up several 'Observation Methods' as required, which can be selected from the toolbar (Figure 13), or the 'Microscope Control' window (Figure 7).

Acquisition	Processing	Count and Measure
N DAPI 🐺 FI	tc 😻 tritc I	💐 Cy5 🕵
Figure 13: Several 'Ob:	servation Metho	ds' visible along the toolba

5.3 Experiment Manager

1. Navigate to the 'Experiment Manager' tab of the 'Microscope Control' window, and click 'New'.



Figure 14: 'Experiment Manager' window







2. This opens the 'Experiment Manager' page. Click the 'Image Acquisition' dropdown to add Observation Methods, which can be added as a time-lapse (see Figure 15).



Figure 15: An example of a multi-channel time-lapse in 'Experiment Manager'

Note:

• Other methods can also be created separately and then saved and reloaded. For example, if 385 nm/490 nm/525 nm was needed for a different experiment, this method could be saved as well. These template methods can be used to speed up the day-to-day setting up of experiments.

For more information, please refer to cellSens help guide or manual. For questions regarding CoolLED Illumination Systems, please contact <u>info@coolled.com</u>.

