



Quick Start Guide for LAS X

IQS004- Rev 02

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1 Integrated CoolLED Products:

- pE-300^{white}, pE-300^{ultra} & pE-340^{fura}
- pE-4000

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

1. The CoolLED driver file should be downloaded from the CoolLED website:

http://www.coolled.com/product-detail/imaging-software/

N.B. This is a general driver for Windows machines and all USB controlled CoolLED Illumination Systems (pE-2, pE-300 Series & pE-4000).

- 2. Save the files (.inf and certification files) to a preferential location on your Computer (e.g. Desktop)
- 3. When the CoolLED Illumination System is plugged in, it will appear with a driver required warning (Yellow exclamation mark). Right click and 'update' the driver, pointing it to the previously downloaded directory containing the .inf file.
- 4. Once the CoolLED Illumination System has been successfully installed into Windows, check the Virtual COM ports assigned by going into Device Manager. The CoolLED Illumination System should be listed under 'Ports' (COM & LPT):







Figure 1: Device Manager with a 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). Additionally, it allows for ease of use if there is a COM port conflict.





3 Installing & Configuring your CoolLED Illumination System in LAS X

3.1 Installation

1. To install and configure LAS X to use a pE-300 Series or a pE-4000, the 'Leica LAS X Hardware Configurator' needs to be opened before opening LAS X itself.



Figure 2: 'Leica LAS X Hardware Configurator' icon

2. After opening the 'Leica LAS X Hardware Configurator', the 'setup' window will appear; navigate to the 'Hardware Setup'.





3. The hardware setup screen allows configuration of the Microscope and Light source; There are several drop downs to alter these. In the below example, a Leica DMI8 has been selected as the Microscope, and the pE-4000 has been selected as the 'Multi-colour- Lightsrc'. Ensure that you have selected the correct COM Port for the pE product, which should correspond with the COM port that Windows defined earlier and is viewable in Device Manager.



<u>fetca</u> —0	7					
Please select the connected Microscope and Image-Source.						
Microscope		Leica DMI8 💠 🕞				
Test	Connection	MANUAL \$				
	Stage-Controller Multicolor-Lightsrc.	CoolLED pE-4000 ¢ COM1 ¢				
		EL6000 Extern COM1 \$ Leica ZFine Pifoc \$ NI DAQ Controller USB \$				
		GSD Options				
		Simultaneous Acquisition System				
Hardware Configuration: Standard Configuration OK Cancel Apply						

Figure 4: 'Hardware Setup' Window





4. It is possible to save the configuration that has been created by using the drop down; clicking 'New' will create a new configuration, and any that have been already created are automatically saved:

Hardware Configuration: Standard Configurat	ion	▲			
The Hardware Configuration can be saved, renamed and deleted. Previously saved Hardware Configurations can be recalled.					
Configurations System Standard Configuration User		Edit selected Configuration Data Name : Standard Configuration Type : System User			
	~	New Delete			
		OK Cancel Apply			

Figure 5: 'Hardware Configuration' drop-down for saving a configuration

5. Once the selection of setup components is completed, click 'Apply', and then click 'OK'. This will close this window and return to the 'Leica LAS X Hardware Configurator'.





3.2 Configuration

- 1. From the 'Leica LAS X Hardware Configurator' window, this time select the 'Configure' tab. This will bring up some sub windows; which allow configuration of several parts of the LAS X setup.
- 2. In order for the system to operate correctly, it is necessary to match up the CoolLED Illumination System wavelengths with filters in LAS X configuration; this is possible by selecting the 'IL- Turret' tab in 'Configure', and then double clicking on the relevant filters:



Figure 6: The 'IL- Turret' window, within 'Configure'

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6	MANUAL-IL-TURRET(6-POS)								
Q	λ		'DAPI'						
	Setup Component Data								
P	osition		Name						
1	'D E)	0API' - K: 350/50 DC: 4	400 EM: 460/50						
2	'FI E2	'FITC ' - EX: 480/40 DC: 505 EM: 527/30							
3	'L E)	"LED_530" - EX: 525/50 DC: 560 EM: 605/70							
4	'L E)	"LED_590" - EX: 585/40 DC: 610 EM: 650/65							
5	'Y E)	Y5' - EX: 620/60 DC: 660 EM: 700/75							
6	'SpX-Q' - 6 EX: LP DC: 415;490;570;660 EM: 430/35;515/40;595/40;720/100 ✓								
			>						
Sea	arch filter: /	ACTIVE entries fo	und(129/129)		Table Version:				
					337				
	ArticleNo	Name	LongText	ExcitationFilter	Dich				
1	11525301	DAPI_LP	-	360/40	400 🔺				
2	11525302	FITC_LP	-	470/40	510				
3	11525303	RHOD_LP	-	540/45	580				
4	11525319	FITC/TXR	-	470/40; 573/35	495;				
5	11525315	FI/TRITC	-	470/40; 548/15	495;				
6	11525316	CFP/YFP	-	435/25; 500/20	450;				
7	11525320	C/Y/RFP	-	436/20; 503/21; 575/25	455;				
8	11525317	DAPI/TRI	-	395/30; 545/30	430;				
9	11525318	DAPI/FI	-	395/30; 485/25	418;				
10	11525323	GFP-T	GFP for TIRFM; Laser excitation at 488nm (VBG Laserbox and Argon laser)	475/40	500				
11	11525324	324 YFP-T YFP for TIRFM; Laser excitation at 488nm (VBG Laserbox)		495/30	515				
12	11525325	325 CFP-T CFP for TIRFM; Laser excitation at 405nm (VBG Laserbox) 420/40 450		450 -					
	4				Þ				

Figure 7: Close up of the available filter positions (Top) and selectable Filters (Bottom) that are already integrated into LAS X







Figure 8: The filters as viewed in 'Acquire' Mode

3. Additionally, it is possible to configure and control each channel on the pE-4000 via TTL in LAS X. Under the 'Sequencer' tab (shown below), clicking 'TTL Triggers' will bring up a window in which the BNC's can be assigned:

File Cameras Help	Dark 🗘				
Setup	TTL Triggers				
💩 🚍 🙆 🔚	TTL in Ch A				
Hardware Firmware Configure Software Setup Update Update	Setup Component Data				
Components	Position Location Name				
	1 TTL1 TTL in Ch A				
	2 TTL2 TTL in Ch B				
DMIB Focusdrive Nosepiece DIC-Turret	3 TTL3 TTL in Ch C				
	4 TTL4 TTL in Ch D				
	5 Sys2-TTL-E1				
IL-Turret Cameras Ports Function-	6 Svs2-TTI-F2				
Sequencer	Search filter: ACTIVE, entries found(16/16)				
Subcomponents					
	1 Camera				
	3 TL shutter				
System TTL Triggers Triggers	4 TTL in Ch A				
	5 TTL in Ch B				
	6 TTL in Ch C				
	7 TTL in Ch D				
	9 System out 2				
	10 System out 3				
	11 System out 4				

Figure 9: 'TTL Triggers' within the 'Configure' window





4. With the configuration now complete, the 'Leica LAS X Hardware Configurator' can now be closed and LAS X itself can be opened:



Figure 10: 'LAS X' icon

5. After opening LAS X, the CoolLED Illumination System will appear on the left-hand side of the 'Acquire' window, under 'LED Illumination'. The CoolLED Illumination System can be controlled by intensity sliders, wavelength drop downs (for the pE-4000) and individual channel shutters.



Figure 11: 'Multi-Colour Illumination'- Control for pE products





Figure 12: An example of the pE-4000 set up in 'Acquire' Mode in LAS X