

application note

pco.camware X-Cite integration



Excelitas PCO GmbH asks you to carefully read and follow the instructions in this document. For any questions or comments, please feel free to contact us at any time.



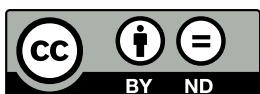
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pco.camware X-Cite integration application note

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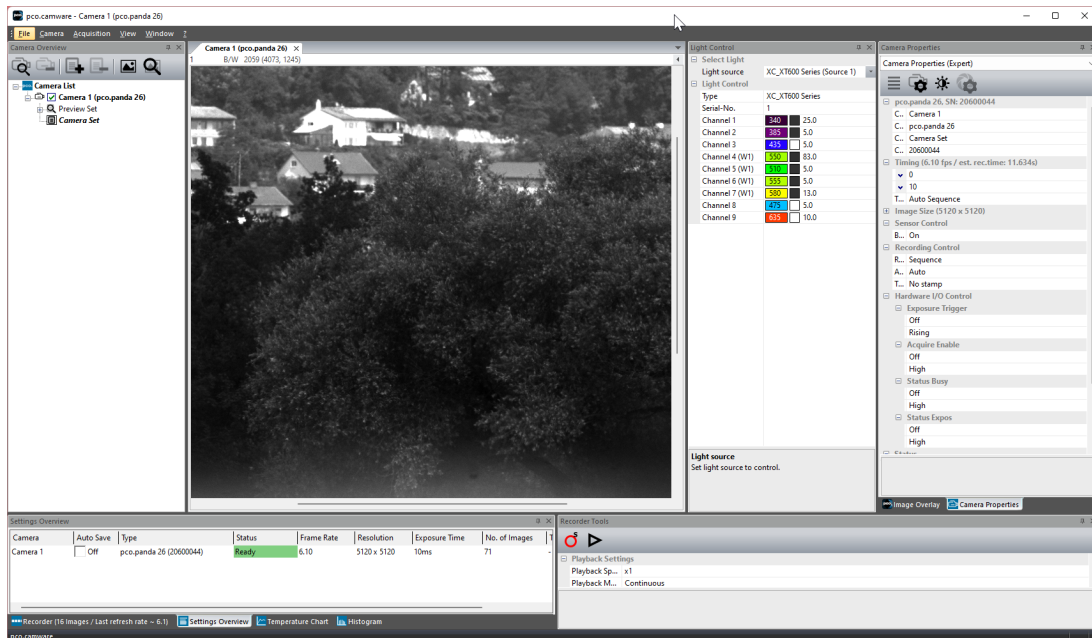
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Contents

1 Overview	4
2 Usage	5
2.1 Light Control Dialog	6
2.1.1 Channel Settings	6
3 Sync Light with Acquisition	7
4 Auto-Link Light Source	9

1 Overview

With our latest version of pco.camware (4.16.0) you are now able to also control Excelitas X-Cite® light sources within pco.camware. This makes it very intuitive to use X-Cite light sources together with PCO cameras without the need of using and maintaining multiple applications.



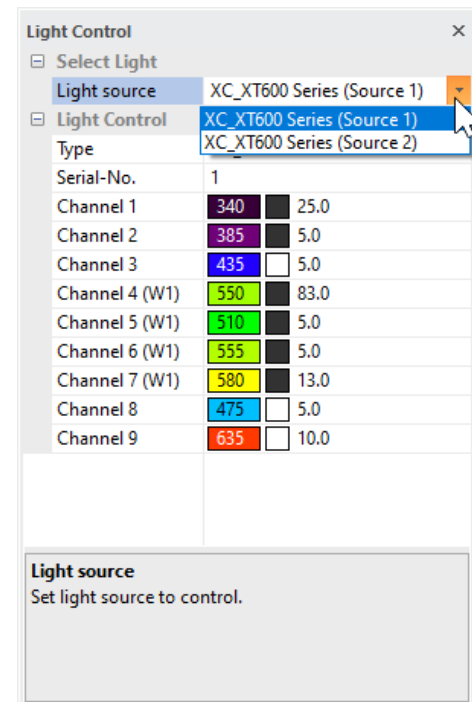
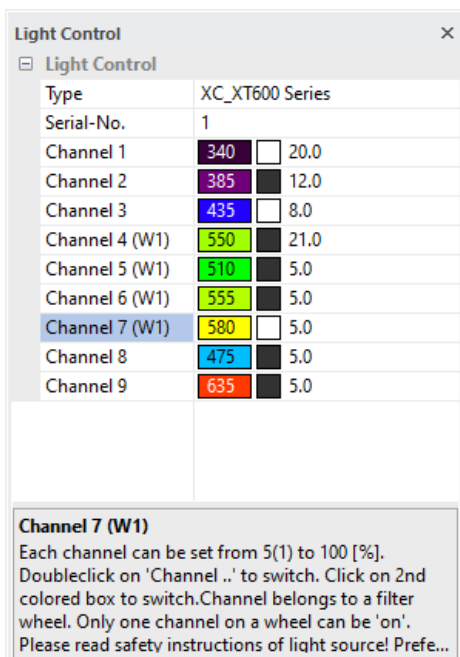
This application note is a quick start guide on how to enable and use this new X-Cite control feature inside pco.camware. Therefore you do not need to install **any** additional driver or software for X-Cite, just installing pco.camware as usual is enough.

If you encounter any problems with your X-Cite light source, please visit the X-Cite homepage (<https://www.excelitas.com/de/product-category/x-cite-illuminators>) for further information.

2 Usage

In order to use the X-Cite light control in pco.camware, you have to make sure that your light source is switched on and is connected to your PC **before you start pco.camware**

On startup, pco.camware automatically searches for all connected cameras and now also for all connected X-Cite light sources. If at least one light source is found, the associated light control dialog will appear. This dialog is shown below. See left for one connected light source, or right for multiple connected light sources.



Tip Make sure to activate the histogram in the GUI and deactivate auto range to easily track the brightness changes in the images when changing the light intensity.

Per default, the light is only switched on when recording is active! This behavior can be changed in the settings, see chapter 3.

2.1 Light Control Dialog

The usage of the light control dialog is very intuitive.

- **Light source** controls which light source is currently active (This is only visible if multiple light sources are connected)
- **Type** displays the windows driver name of the X-Cite light source
- **Serial-No** displays the serial number of the X-Cite light source
- **Channel X** controls the channel with number X of the light source. Depending on the light source you can either have multiple channels or only one (e.g. for a white light source)
- The gray box below the list will always display additional information for the currently selected element

Note In the screenshots you will see a **(W1)** on some of the channels. This indicates that for activating this channel, a movement of the filter wheel might be necessary, which will take approximately 2 seconds. Additionally, only one of the channels on the filter wheel can be activated at a time (this is automatically handled by pco.camware), while all other channels can be controlled independently.

2.1.1 Channel Settings

The control of each channel consists of 3 elements

Channel 2	385	<input type="checkbox"/>	9.0
Channel 3	435	<input type="checkbox"/>	7.0

which are (from left to right):

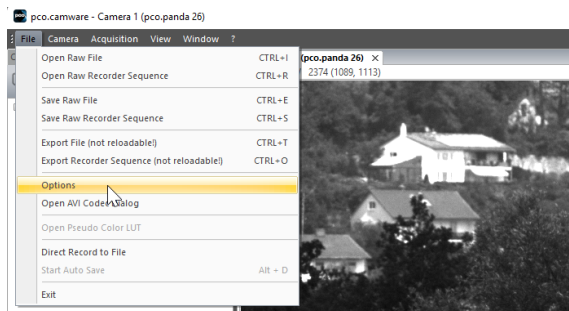
- a display of the wavelength of the channel, colored in approximately the color that corresponds to the wavelength
- a checkable box for activating and deactivating the channel. In default each channel is off (= black, like *Channel 2* in the screenshot above), when clicking on this box the channel will be activated (= white, like *Channel 3* in the screenshot above)
- a numerical input to control the intensity of the channel. You can change the intensity value with either the mouse wheel or the keyboard. The intensity can be set in a range from 5.0 to 100.0 with a stepping of 1.0

3 Sync Light with Acquisition

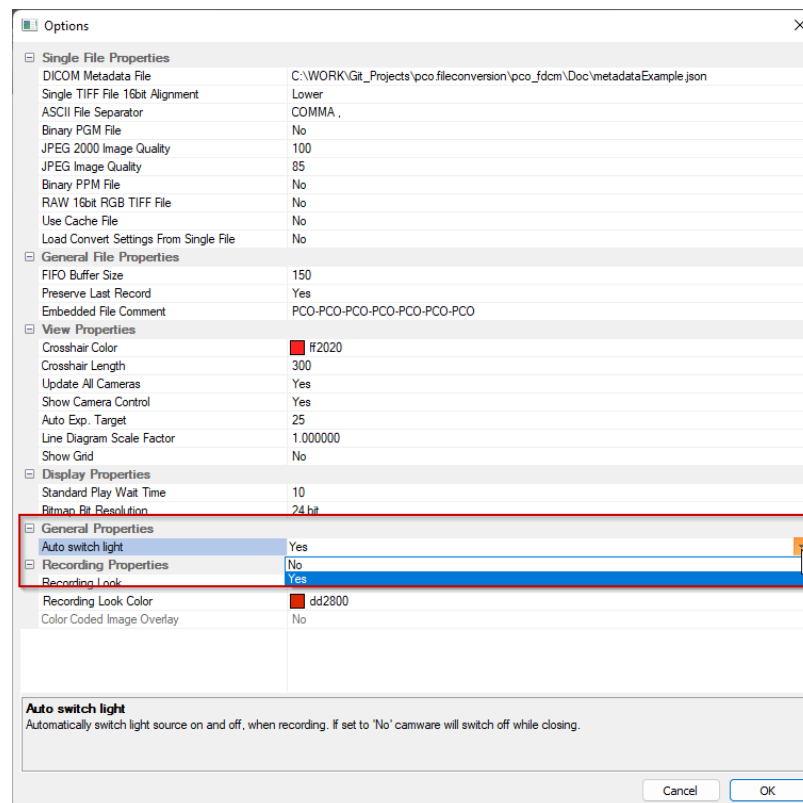
The software is able to control the sync of the light source with the recording state of the camera. This means that the light is only **ON** when the camera is actually recording (i.e when pco.camware GUI is red). In this mode, activating the channels (setting associated boxes to white) will not directly activate the light. Only during active recording the light is activated according to the current selections in the light control dialog.

This feature prevents your sample from over-exposition. Thus, permanent damage of the imaged cells and/or bleaching of your fluorophore can be minimized.

Per default, this feature is **enabled** as it is the typical use case. For permanent illumination please open the pco.camware options menu, which can be found under *File -> Options*



There you will find the corresponding setting under *General Properties -> Auto switch light*.



Switching this from **Yes** to **No** will deactivate the described behavior.

Note The synchronization that is described here refers to the recording state of the camera, i.e. will be switched on when recording starts and switched off when the recording ends. For some applications you may want to have the light source only active during the actual exposure time of an image and it should be switched off during delay and readout. For this you need to synchronize the exposure output signal with the TTL of your light source. Please read the manuals of your PCO camera and your X-Cite light source for further information on this.

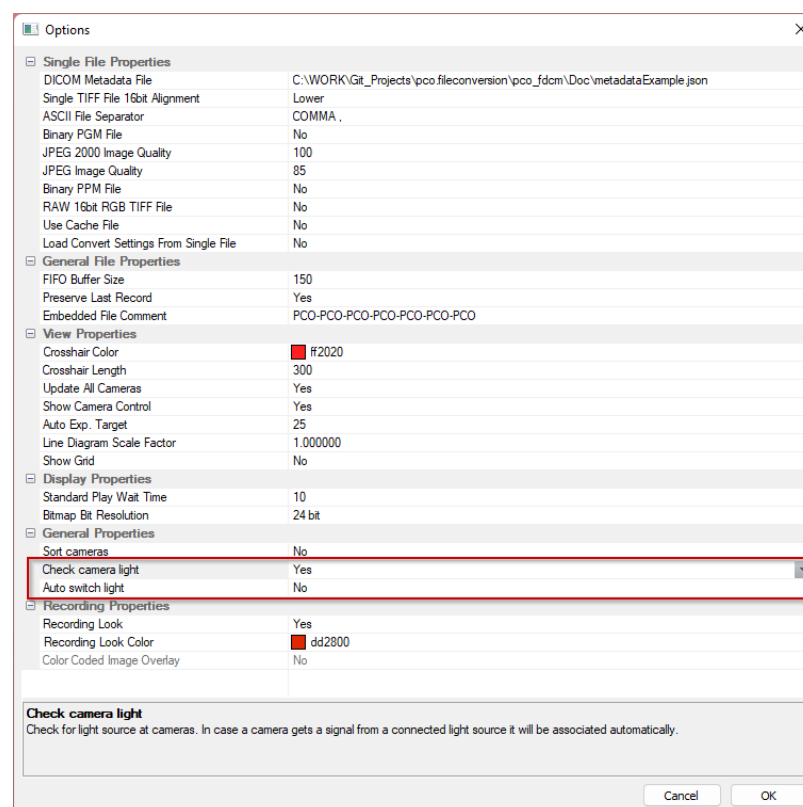
4 Auto-Link Light Source

When you are working with at least 2 cameras and at least 2 light sources, pco.camware has an additional feature to automatically link a light source to a camera. **This is done automatically on startup of pco.camware.** For successful auto-link, please ensure an open beam path, so that light from the source can be detected by the camera. When an assigned camera is selected in the *Camera List*, the linked light source automatically becomes also selected in the light control dialog. Thus, you always configure the correct light source for the camera.

To enable this feature:

- at least 2 cameras must be connected
- at least 2 light sources must be connected
- the *Auto switch light* option must be set to **No** (see chapter 3)
- the *Check camera light* option must be set to **Yes** (default is **Yes**, see figure below) ¹

If these settings are selected, the auto-link will be done on the next startup of pco.camware.



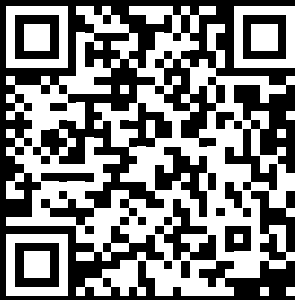
Always be sure to follow the X-Cite safety instructions. Never look into the beam or hold the light guide in your hands when the light source is on. Be especially careful when this feature is activated.

¹This option is only visible when at least 2 cameras are detected

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