

## Would you like a bit longer? Long exposure with CMOS sensors

An exposure of several seconds is referred to as long exposure. Some uEye models with CMOS sensors allow a long exposure, for example up to 10 seconds. So these sensors offer an interesting and cost-saving alternative to CCD sensors.

### Background

If you capture an image in low light conditions, you must usually work with a high gain in order to get some details out of the image. However, a high gain causes more image noise and thus an image quality loss.



*Capture without long exposure*

This is where long exposure comes into play: it allows to capture high quality images with low noise even in low light condition.



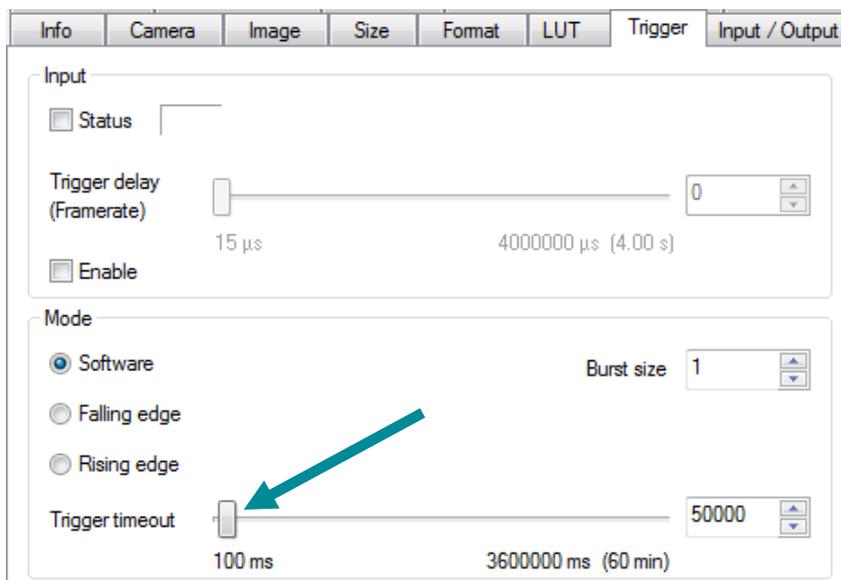
*Capture with long exposure at 1 Lux with 10 seconds and double gain*

## Using long exposure

If you use long exposure the camera should not be operated in freerun mode. Otherwise it would last, for example up to 10 seconds until the camera provides an updated image. Use instead trigger mode with single shots. You can fire a software

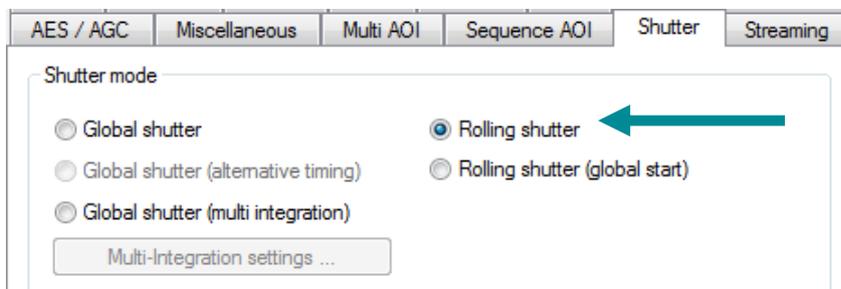
trigger in uEye Cockpit using the corresponding button in the tool bar: 

Also keep in mind that the timeout has to be adjusted for long exposure to avoid wrong timeout messages. For this purpose, open the “Properties” dialog in uEye Cockpit. You set the timeout in the “Trigger” tab.



*Increasing the timeout in uEye Cockpit*

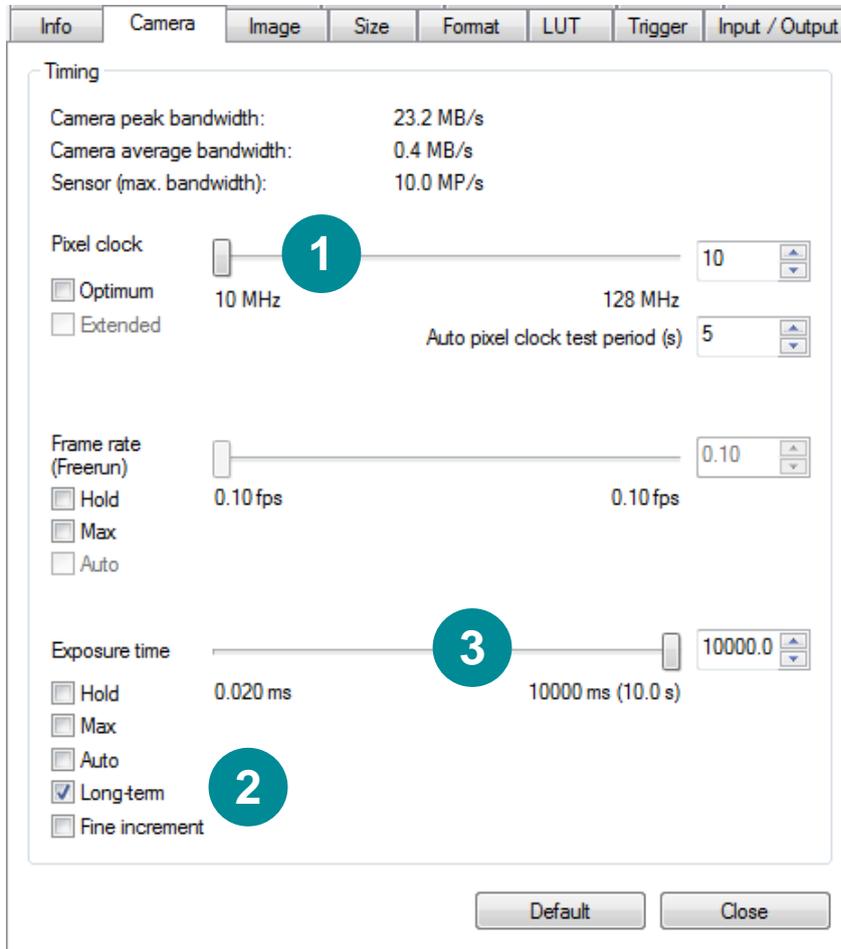
For long exposure, we recommend to use the rolling shutter mode if this mode is supported by the camera. Activate the rolling shutter mode in the “Shutter” tab in uEye Cockpit.



*Activating the rolling shutter mode in uEye Cockpit*

Afterwards, you set the pixel clock to minimum value (1) in the “Camera” tab and activate the “Long-term” option (2). Now the largest possible exposure time increases to the maximum long exposure time (3), in this example up to 10 seconds.

(You can also use this method for cameras which do not support long exposure. Just set pixel clock and frame rate to the minimum values to get the maximum exposure value.)



*Configuring long exposure in uEye Cockpit*

## Application areas

The long exposure is ideal for all applications where captures have to be done with low light conditions. Due to the extended exposure time it is not necessary to increase the gain. Thus, too much image noise can be avoided.

This is of interest for example in microscopy when in low light conditions an image has to be read out, since otherwise the light-sensitive sample would be destroyed, or in the field of fluorescence analysis.

Long exposure is especially suitable for medical technology, quality assurance, mechanical engineering, or in astronomy.

**Summary**

Long exposure allows the realization of application with low light conditions. CMOS sensors which offer a long exposure are a cost-saving alternative to CCD sensors and cover a wide range of application areas.

For more information on configuring and programming the long exposure, refer to the uEye manual at <http://en.ids-imaging.com/manuals-ueye.html>.

Use the [Camera finder](#) on our website to get all camera models which support the long exposure.

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