Helpdesk XIMEA

Multiple exposures in one frame

Support SK - 2025-06-09 - in Camera Features

https://www.ximea.com/support/wiki/allprod/multiple_exposures_in_one_frame

Multiple exposures in one frame¶

Camera models support¶

Some of the XIMEA cameras support multiple exposures exposed into a single frame.
The models supporting this feature are based on Sony Pregius sensors like:
IMX252, IMX250, IMX255, IMX253

Camera models with these sensors can be found in the following camera families:
xiC camera family
xiX camera family

This feature can also be implemented (currently is **NOT**) in cameras based on Sony Pregius S sensors like:
IMX547, IMX546, IMX545, IMX542, IMX541, IMX540, IMX537, IMX536, IMX535, IMX532, IMX531, IMX530

Introduction¶

The number of exposures can be defined using the XiApi parameter XI_PRM_EXPOSURE_BURST_COUNT.
The readout of the frame starts after the last exposure period has finished.

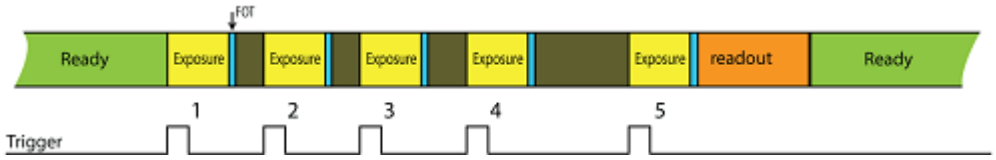
According to Sony, the maximum number of exposures per frame is 4095, but note that there is a gap between each exposure which could be ~50-150µs depending on the sensor.
As you can see below this feature can work in two modes - either with defined bursts or as trigger pulses.

Exposure defined by XiApi parameter "XI_PRM_EXPOSURE"¶

In this mode, the trigger defines the start of the exposure but the length of the exposure is defined by the XI_PRM_EXPOSURE xiApi parameter. Set exposure length using XI_PRM_EXPOSURE parameter and set XI_PRM_TRG_SELECTOR to **XI_TRG_SEL_EXPOSURE_START**.

```
// Set exposure
xiSetParamInt(xiH, XI_PRM_EXPOSURE, 1000);
```

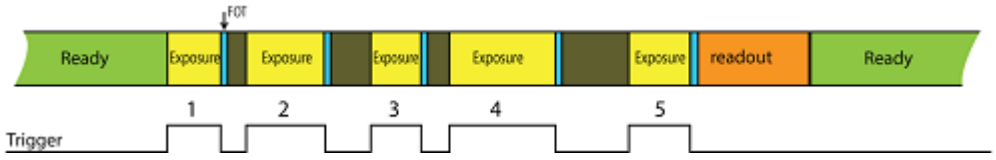
```
// Set the number of times of exposure in one frame
xiSetParamInt(xiH, XI_PRM_EXPOSURE_BURST_COUNT, 5);
// Set trigger selector
xiSetParamInt(xiH, XI_PRM_TRG_SELECTOR, XI_TRG_SEL_EXPOSURE_START);
```



Exposure defined by the length of the trigger pulse¶

In this mode, both the start of the exposure as well as the length of the exposure is defined by the trigger pulse. Set XI_PRM_TRG_SELECTOR to **XI_TRG_SEL_EXPOSURE_ACTIVE**. The exposure length will be defined by the trigger pulse length.

```
// Set the number of times of exposure in one frame
xiSetParamInt(xiH, XI_PRM_EXPOSURE_BURST_COUNT, 5);
// Set trigger selector
xiSetParamInt(xiH, XI_PRM_TRG_SELECTOR, XI_TRG_SEL_EXPOSURE_ACTIVE);
```



Note: In both of the above modes there is a short period (FOT) after each exposure during which time the next exposure cannot start. In the case of the cameras with IMX sensors, this period is 11*line_period (the line_period depends on various other parameters, see Line Period in the Camera performance calculator).

Note2: None of the above two modes support start of exposure during readout (trigger overlap feature).

Note3: Limitations of the IMX sensors in multi-exposure mode lead to an increase in noise in comparison to a single exposure frame.

Note4: The multi exposure mode does not work ideally when ultra short exposure times are used (<15us).