# IDT technical Note: **0012 (2015/01/19)**

# "SDK: auto-exposure"

## Auto-exposure parameters

- XSP_AE_ENABLE: enables and disables the auto-exposure.

- XSP_AE_ROIX, XSP_AE_ROIY, XSP_AE_ROIWIDTH, XSP_AE_ROIHEIGHT: configures the auto-exposure region of interest. That is, the area of the sensor that is used to automatically configure the exposure.

- XSP_AE_SPEED: configures the reaction speed to changes in the image intensity (0: slow, reacts within a few frames and averages; 7: fast, reacts within one frame).

- XSP_AE_REFERENCE: configures the reference value of intensity (the "Luminance" in the AE region of interest). The camera changes the exposure to make the image intensity in the AE ROI equal to this value.

- XSP_AE_CUR_LUMA (read-only parameter): the current value of the intensity in the AE region of interest. This value should be read before enabling the AE and used to set the reference value.

## Auto-exposure configuration

Follow the steps below to configure the auto-exposure parameters in the camera.

- **Open and configure the camera:** Disable the auto-exposure (XSP_AE_ENABLE=0) and set the auto-exposure region of interest (XSP_AE_ROIX, XSP_AE_ROIY, XSP_AE_ROIWIDTH, XSP_AE_ROIHEIGHT).

```
// Configure the camera
XsSetParameter(hCamera, &xsCfg, XSP_AE_ENABLE, 0);
XsSetParameter(hCamera, &xsCfg, XSP_AE_ROIX, 256);
XsSetParameter(hCamera, &xsCfg, XSP_AE_ROIY, 256);
XsSetParameter(hCamera, &xsCfg, XSP_AE_ROIWIDTH, 512);
XsSetParameter(hCamera, &xsCfg, XSP_AE_ROIHEIGHT, 512);

// Configure the camera
XsRefreshCameraSettings( hCamera, &xsCfg );
```

- **Calculate the reference value**. Snap an image with the desired intensity and read the current reference value from the camera (XSP_AE_CUR_LUMA).

```
XSULONG32 nRefLuma;

// Snap
XS_FRAME frm;
frm.pBuffer = m_pDataBuf;
frm.nBufSize = m_nBuSize;
fmr.nImages = 1;
XsSynchGrab(hCamera, &frm, 1000);

// read the reference
XsGetParameter(hCamera, &xsCfg, XSP_AE_CUR_LUMA, (nRefLuma);
```

- **Configure the camera for AE**: set the value of AE reference (XSP_AE_REFERENCE), set the desired speed (XSP_AE_SPEED) and enable the auto-exposure ( XSP_AE_ENABLE=1).

```
// set the parameters
XsSetParameter(hCamera, &xsCfg, XSP_AE_SPEED, nRefLuma);
XsSetParameter(hCamera, &xsCfg, XSP_AE_SPEED, 3);
XsSetParameter(hCamera, &xsCfg, XSP_AE_ENABLE, 1);

// Configure the camera
XsRefreshCameraSettings( hCamera, &xsCfg );
```

- **Record**: set the camera in live mode (XsSynchGrab) or record a sequence in camera memory (XsMemoryStartGrab).