

Configure the cameras

Aim

To adjust settings in a Basler GigE camera or USB 3.0 camera, like the video frame rate, video frame resolution, and exposure time, within the camera software.

NOTE Settings are stored in the camera software, not on the PC. When you work with multiple cameras, repeat the procedure for each camera.

Procedure (general)

1. Make sure MediaRecorder (and EthoVision XT, when present on the computer) is not running.
2. Start the **Basler Pylon Viewer** software that comes with the GigE cameras.

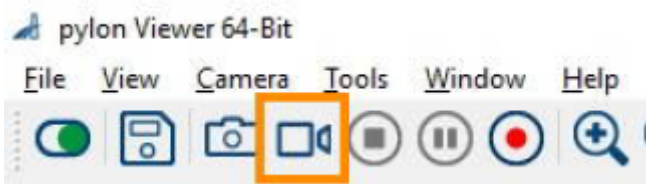


NOTE The Basler Pylon Viewer software is installed automatically when you install the camera drivers.

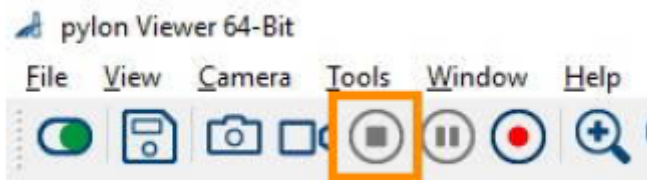
3. Click the **Basler camera**.



4. To preview the camera image, click the **Continuous Shot** button on the toolbar.



NOTE To be able to adjust the settings, click the **Stop** button first.



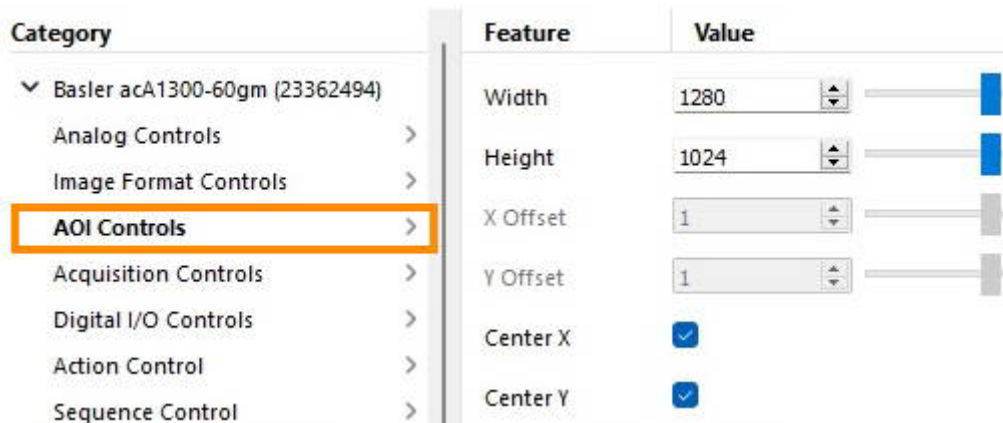
5. Follow the instructions below that apply.

To center the camera view

With this procedure you make sure the camera view is centered.

IMPORTANT If you center the camera view in MediaRecorder, the settings may not be stored in the camera drivers. Here in Pylon viewer you make sure that the settings are stored in the drivers, also for future recordings.

1. In the **Features** panel, open the **Basler camera** item and then the **AOI Controls** item (**Image Format Control** for USB 3 cameras).
2. Select both options **Center X** and **Center Y**.



3. Save the settings.
See [To save the camera settings](#)

To set the pixel format

NOTE This option applies to black and white digital cameras.

1. In the **Features** panel, open the **Basler camera** item and then double-click **Image Format Controls**.
2. Set the **Pixel Format** to **Mono 8**.
3. Save the settings.

See [To save the camera settings](#)

IMPORTANT This corresponds to the option Y800 in MediaRecorder. In Pylon viewer you make sure that the settings are stored in the drivers, also for future recordings.

To adjust the camera exposure time

The exposure time (or shutter time) is the time the camera shutter is kept open to let light in. The exposure time limits the maximum achievable frame rate. If the sum of the exposure time and the time needed for reading the chip (readout time) is greater than the time between consecutive video frames, the next frame may be dropped, resulting in a lower frame rate, and missed samples during tracking.

To adjust camera exposure that matches a frame rate:

1. In the **Features** panel, open the Basler camera item and then double-click **Acquisition Controls**.
2. Make sure that **Exposure mode** is **Timed**, and **Exposure Auto** is **Off**.
3. Next to **Exposure Time (Abs) [us]**, enter the exposure time you require, in microseconds.
For Zebrafish larvae, enter 4000 or 2000, depending on the video resolution chosen.
In all other cases, you may choose a higher value. For rodents a value below 20000 is fine.
Faster animals require shorter exposure times.
Press **Tab** or click another field to confirm.

4. To check that the exposure time is compatible with your frame rate, click the **Continuous Shot** button on the toolbar.

pylon Viewer 64-Bit

File View Camera Tools Window Help

At the exposure...

new Rate (Abs)

The screenshot shows the 'pylon Viewer 64-Bit' application window. The 'Acquisition Controls' panel is open, displaying various settings. The 'Acquisition Frame Rate (Abs) [Hz]' is set to 25.0, which is highlighted with an orange box. An orange arrow points from this box to the '25.0 fps' label in the bottom right corner of the interface, which is also highlighted with an orange box. The 'Exposure Time (Abs) [us]' is set to 4000.0. The 'Resulting Frame Rate (Abs) [Hz]' is also 25.0. The 'Acquisition Status Selector' is set to 'Frame Trigger Wait'. The 'User Level' is 'Guru'. The 'Show Unavailable Favorites' and 'Polling' checkboxes are checked. The bottom right corner shows '25.0 fps 12.0 MB/s'.

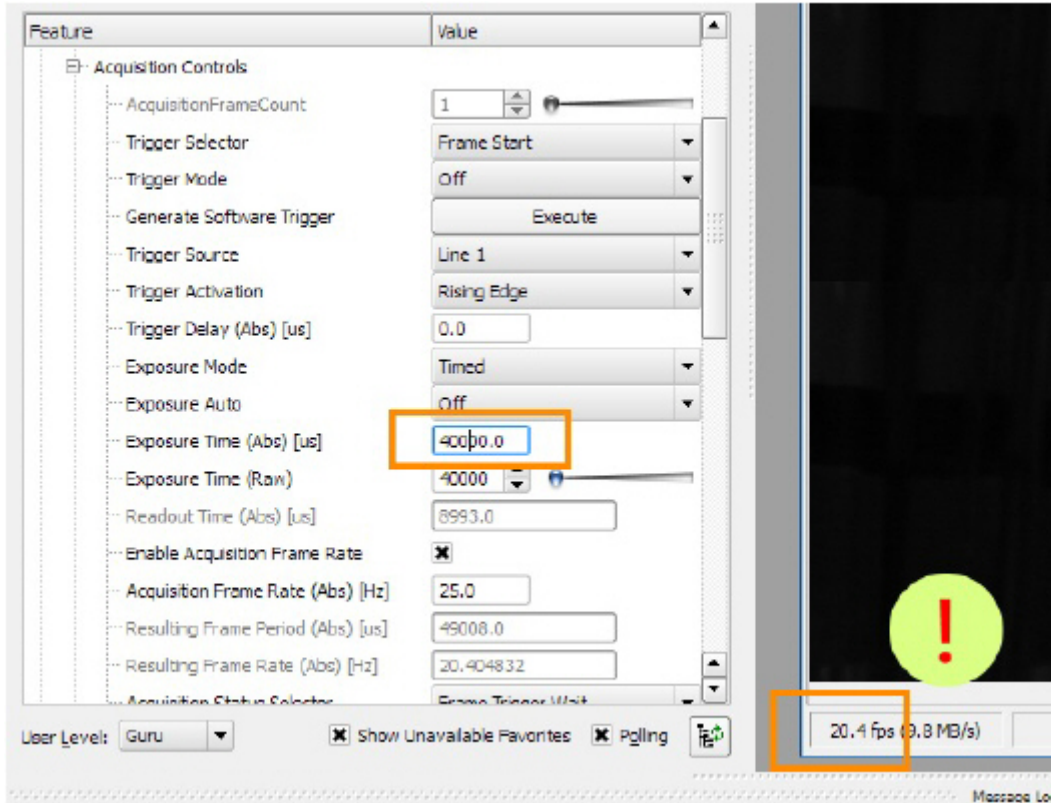
Feature	Value
AcquisitionFrameCount	1
Trigger Selector	Frame Start
Trigger Mode	Off
Generate Software Trigger	Execute
Trigger Source	Line 1
Trigger Activation	Rising Edge
Trigger Delay (Abs) [us]	0.0
Exposure Mode	Timed
Exposure Auto	Off
Exposure Time (Abs) [us]	4000.0
Exposure Time (Raw)	4000
Readout Time (Abs) [us]	8993.0
Enable Acquisition Frame Rate	<input checked="" type="checkbox"/>
Acquisition Frame Rate (Abs) [Hz]	25.0
Resulting Frame Period (Abs) [us]	40000.0
Resulting Frame Rate (Abs) [Hz]	25.0
Acquisition Status Selector	Frame Trigger Wait

User Level: Guru ☒ Show Unavailable Favorites ☒ Polling

25.0 fps 12.0 MB/s

[Hz].

If the resulting frame rate is lower than **Acquisition Frame Rate (Abs) [Hz]**, then either lower the exposure time (this will make the video image darker; open the lens diaphragm to compensate for this), or lower the video resolution. Do this until you see the expected frame rate.



5. Save the settings.

See [To save the camera settings](#)

To adjust the camera gain

This applies to both color and black/white Basler cameras.

IMPORTANT Increasing gain also increase image noise. Do this only if no other option is left to improve the image brightness. For example, make sure that the lens aperture is maximal, and increase lighting.

1. In the **Features** panel, click **Analog Controls**.
2. From the **Gain Auto** list, select **Off**.
3. Next to **Gain (Raw) (Gain [dB] for USB 3.0 cameras)**, select the value you require. A higher Gain results in a brighter image, but also more noise and a grainy image.



4. Save the settings.

See [To save the camera settings](#)

To adjust white balance

If you have a color camera, you also need to adjust its white balance.

1. Click **Color Improvements Control**.

[-] Color Improvements Control	
Balance White Auto	Off
Balance Ratio Selector	Red
Balance Ratio (Abs)	1.5
Balance Ratio (Raw)	96

2. Point the camera at a piece of white paper, so that the camera image is entirely white. Click in the field next to **Balance White Auto** and select **Once** from the list.

[-] Color Improvements Control	
Balance White Auto	Off
Balance Ratio Selector	Off
Balance Ratio (Abs)	Once
Balance Ratio (Raw)	96

3. Save the settings (see below).

To save the camera settings

1. Click the Stop button.



2. In the **Features** panel, open the **Configuration Sets** item (**User Set Control** for USB 3 cameras).
3. From the **Configuration Set Selector** list (**User Set Selector** for USB 3 cameras), select **User Set 1**.
4. Next to **User Set Save**, click **Execute**. The camera settings set in the previous steps are now saved under User Set 1.
5. From the **Default Startup Set** list (**User Set Default** for USB 3 cameras), select **User Set 1**.

For GigE cameras:

[-] Configuration Sets	
Configuration Set Selector	User Set 1
User Set Load	Execute
User Set Save	Execute
Default Startup Set	User Set 1
Default Set Selector	Standard

For USB 3 cameras:

[-] User Set Control	
User Set Selector	User Set 1
User Set Load	Execute
User Set Save	Execute
User Set Default	User Set 1

6. Close Pylon Viewer.

These settings will be used each time you start up MediaRecorder.

TIP You can also save different settings for the same camera in User Set 2 and User Set 3. Under **Default Startup Set (User Set Default)**, select which you want MediaRecorder to use.

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