Command List Reference

Shad-o-Box HS

1. Camera and Sensor Information

Camera and sensor information can be retrieved via a controlling GUI application — in the examples shown here, CamExpert. Parameters such as camera model, firmware version, sensor characteristics, etc. are read to uniquely identify the connected device.

The camera information parameters are listed under the **Camera Information and Image Format Control** set.

Camera Information	
Parameter	Options
Manufacturer Name	
Model Name	
Device Version	
Manufacturer Info	
Product ID and Build Number	Read-only Parameters
Serial Number	
Hardware Revision	
Timing Version	
FPGA version	
MAC Address	
Pixel Format	
Pixel Coding	
Pixel Size	
Width	
Height	

2. Test Patterns

To retrieve a test pattern, select **Diagnose > Image Source Selector** and choose one of the following available test images:

Image Format Control	
Parameter	Description
Image Source Selector	Selects the type of test image that is sent by the camera: • Sensor Data. Image is from the camera sensor. • Sensor Digital Test Pattern. A purity image whose level is set by the sensor digital test pattern value. The equation is 14336+129*Sensor Digital Test Pattern Value • Sensor Analog Test Pattern. • Digital Horizontal Wedge. • Digital Vertical Wedge. • Digital Purity. Image is filled with an image that goes from the darkest possible value to the brightest by 1 DN increment per frame. • Digital Moving H V Wedge.

3. Synchronization Modes

The camera's image exposures are initiated by a trigger signal. The trigger event is either a programmable internal signal used in free running mode, or an external input used for synchronizing exposures to external triggers. These triggering modes are described in more detail in the detector's User's Manual:

- Free running (trigger disabled): The camera free-running mode has a programmable internal timer control the frame period. (*n = 0x040*)
- Triggered: Continuous image captured and controlled by an external trigger signal. (*n = 0x849*)
- Snapshot: Single image captured by external trigger signal. (*n = 0x859*)

The corresponding Sapera command is *SetFeatureValue("SynchronizationMode",n)*.

4. Set Extended Exposure Time

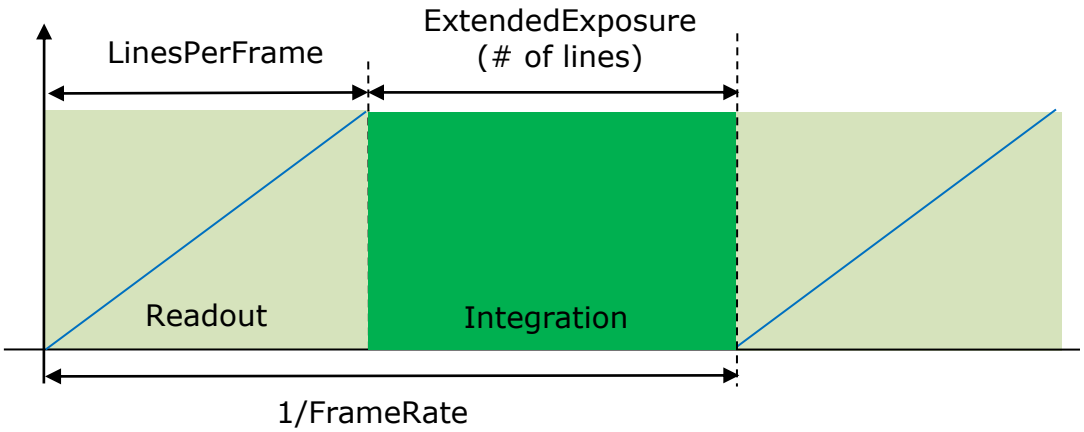
One method to set the camera's frame period (=1/framerate) is use **Detector Control > Extended Exposure**. The value of the extended exposure can be any integer between 1 and 65535.

The Shad-o-Box HS camera frame rate can be calculated as follows:

$$FrameRate\ (fps) = \frac{40{,}000{,}000}{(ExtendedExposure + LinesPerFrame) * ClocksPerLine}$$

where LinesPerFrame and ClocksPerLine are

Camera Model	LinesPerFrame	ClocksPerLine
Shad-o-Box 512 HS	515	2202
Shad-o-Box 1024 HS	515	2202
Shad-o-Box 1280 HS	1320	676
Shad-o-Box 1280v2 HS	1330.35	676
Shad-o-Box 688 HS	690	1395
Shad-o-Box 1548 HS	1550	1395
Shad-o-Box 3K HS	1310	2600
Shad-o-Box 6K HS	2946	2600



The corresponding Sapera command is *SetFeatureValue("ExtendedExposure",n)*.

5. Set Frame Interval

Another method to set the camera's frame period (=1/framerate) is use **Detector Control > Frame Interval (µs)**. The value of the frame interval is in microseconds and can be any integer between 1,000 and 60,000,000 (1 ms to 60 seconds). Please note that on the Shad-o-Box 1K HS and 2K HS, Frame Interval (µs) is named as **Extended Exposure (µs).**

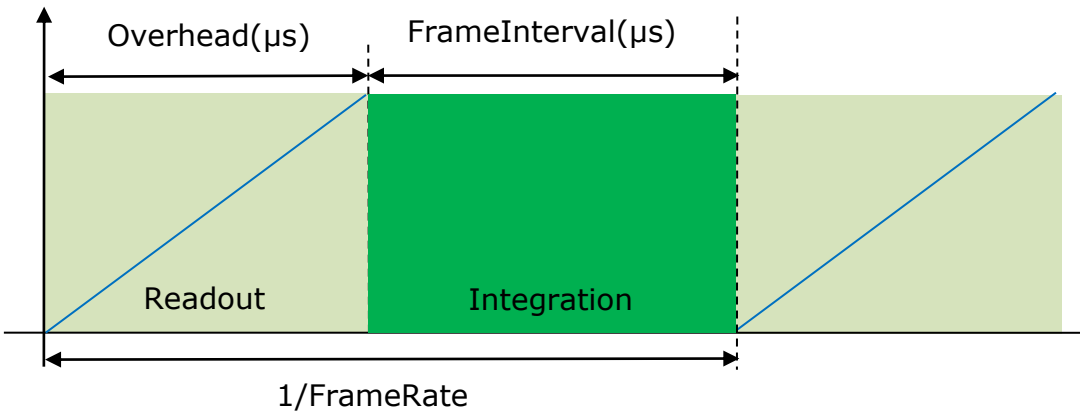
The Shad-o-Box HS camera frame rate can be calculated as follows:

$$FrameRate\ (fps) = \frac{1{,}000{,}000}{FrameInterval(us) + OverHead}$$

where OverHead is

Camera Model	OverHead	Maximum FrameRate
Shad-o-Box 688 HS	13590	66 fps
Shad-o-Box 1548 HS	30478	30 fps
Shad-o-Box 1280 HS	24969	40 fps**
Shad-o-Box 1K HS	29474	33.9 fps
Shad-o-Box 2K HS	98581	10 fps*
Shad-o-Box 3K HS	29470	33.9 fps**
Shad-o-Box 6K HS	66636	15 fps**

*Limited by GigE bandwidth
** by enabling Turbo Drive compression



Please note that **Frame Interval (µs)** is only available on the Shad-o-Box 688 HS, Shad-o-Box 1548 HS, Shad-o-Box 3K HS and Shad-o-Box 6K HS camera models. The corresponding Sapera command is *SetFeatureValue("FrameInterval",n)*.

For Shad-o-Box 1K HS and Shad-o-Box 2K HS, the command is *SetFeatureValue("ExtendedExposure",n)*.

6. Read-out Modes

To set the camera readout mode, use **Detector Control > Read-out Mode**. Available modes are:

- Normal (full resolution, HFW)
- Binning 2x2 mode
- Region of Interest (ROI)

The corresponding Sapera command is *SetFeatureValue("ReadOutMode",n)*.

The available readout modes and the corresponding value of *n* are defined in the following table:

Camera Model	Normal	Binning	ROI
Shad-o-Box 1280 HS	0	1	2
Shad-o-Box 688 HS	0	1	2
Shad-o-Box 1548 HS	0	1	2
Shad-o-Box 1K HS	0	1	2
Shad-o-Box 2K HS	0	1	2
Shad-o-Box 3K HS	0	1	2
Shad-o-Box 6K HS	0	1	2

When read-out mode is set at ROI, please use the following command to select ROI window size.

Mode	Sapera Command
Detector Control > ROI Start H	*SetFeatureValue("ROIStartH",n)*
Detector Control > ROI Stop H	*SetFeatureValue("ROIStopH",n)*
Detector Control > ROI Start V	*SetFeatureValue("ROIStartV",n)*
Detector Control > ROI Stop V	*SetFeatureValue("ROIStopV",n)*

7. Full Well Selection

To select the camera "full well" (saturation capacity) setting, use **Detector Control > Full Well Selection.**

The corresponding Sapera command is *SetFeatureValue("FullWell",n)*, where *n=0* for High Full Well and *n=1* for Low Full Well.

Please note that the **Full Well Selection** feature is only available on the Shad-o-Box 688 HS, Shad-o-Box 1548 HS and Shad-o-Box 1280 HS camera models.

8. Pixel Packing

To select the camera "Pixel Packing" setting, use **Image Format Control > Pixel Packing**.

The corresponding Sapera command are
To select Mono 14 mode, use command: SetFeatureValue("PixelPacking","Mono14")
To select Mono 16 mode, use command: SetFeatureValue("PixelPacking","Mono16")

9. Turbo Transfer Mode

To enable the camera turbo transfer mode, use **GigE Vision Host Controls > Turbo Transfer Mode.**

The corresponding Sapera command are
To turn on, use command: SetFeatureValue("turboTransferEnable",true)
To turn off, use command: SetFeatureValue("turboTransferEnable",false)

Please note that the **Turbo Transfer Mode** feature is only available on the Shad-o-Box 688 HS, Shad-o-Box 1548 HS, Shad-o-Box 3K HS, Shad-o-Box 6K HS, and Shad-o-Box 1K HS camera models.