



COAXPRESS CAMERAS

# Bonito PRO Features Reference

V1.1.0

# Legal notice

**Read this reference carefully**

Read this reference to fully understand your camera's features.

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# Contact Allied Vision

## Website

To directly contact Allied Vision with any inquiry, go to:

[www.alliedvision.com/en/meta-header/contact](http://www.alliedvision.com/en/meta-header/contact)

To find an Allied Vision office or distribution partner, go to:

[www.alliedvision.com/en/about-us/where-we-are](http://www.alliedvision.com/en/about-us/where-we-are)

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# Introduction



This chapter includes:

- About this document
- Document history
- Layout styles and symbols used in this reference
- Acronyms and abbreviations used in this reference

## About this document

This document describes the standard and advanced camera controls for Allied Vision Bonito PRO cameras.



Vimba Viewer and Vimba SDK currently do not support Bonito PRO cameras. Please configure features in the frame grabber GenICam browser or SDK.



Some features listed in this reference may or may not be compatible with your frame grabber. For more information, contact the frame grabber manufacturer.



### Further information available online

For more information about Allied Vision cameras, visit our website:

[www.alliedvision.com/en/products/cameras](http://www.alliedvision.com/en/products/cameras)



Some features are not available for all camera models.

Example: White balance is not available for monochrome or NIR models.

Some features are implemented in the cameras, but are not always available.

## Document history

Version	Date	Remarks
V1.1.0	2019-Dec-03	Corrected the number of supported sequence sets to 16
V1.0.1	2019-Jul-08	Various minor corrections
V1.0.0	2018-May-31	New Reference- Release status

Table 1: Document history

## Reference conventions

To give this reference an easily understood layout and to emphasize important information, the following typographical styles and symbols are used.

### Styles

Style (example)	Function
<b>Emphasis</b>	Some important parts or items of the text are emphasized to make them more visible.
<b>Feature names</b>	Git features names are displayed as monospaced text.
<b>Feature options</b>	Features options and register's options that are selectable by the user are displayed as monospaced italicized text.
<b>UI Element</b>	Text that is displayed, or output, by the system for the user, like parts of the GUI, dialog boxes, buttons, menus, important information, windows titles.
<a href="#">Web Reference</a>	References to other documents or webpages, like web links, hypertext links, emails, but also cross references, that include a link the user can follow by clicking.

Table 2: Markup conventions used in this reference

### Access

Access level	Description
Read/Write	Feature is read/write.
Read/(Write)	Feature is read only. It may be read/write depending upon the user privilege level
Read/Constant	Feature is read only and the value is constant.
Read	Feature is read and the value may change.
Write	Feature is write only.

Table 3: Feature access



## Visibility

Level	Meaning
Beginner	Basic features
Expert	Features that require a more in-depth knowledge of the camera functionality. This is the visibility level for all advanced features in the cameras.
Guru	Advanced features that might bring the cameras into a state where it does not work properly anymore if it is set incorrectly for the camera's current mode of operation.

Table 4: Feature visibility levels

## Symbols and notes



### Practical hint

This symbol highlights a practical hint that helps to better understand the camera's features and functions, and to make better use of it.



### Safety-related instructions to avoid malfunctions

This symbol indicates important or specific instructions or procedures that are related to product safety. You have to follow these instructions to avoid malfunctions.



### Further information available online

This symbol highlights URLs for further information.

## Acronyms and abbreviations

The following table provides a list of acronyms and abbreviations used in this document.

Acronym or abbreviation	Description
dB	Decibel
EF	Electro-Focus
Hz	Hertz

Table 5: Acronyms and abbreviations used in this document (sheet 1 of 2)

Acronym or abbreviation	Description
I/O	Input/Output
LSB	Least significant bit
LUT	Look-up table
ROI	Region of interest
SFNC	Standard Features Naming Convention (GenICam)
SNR	Signal to noise ratio
SQRT	Square root

*Table 5: Acronyms and abbreviations used in this document (sheet 2 of 2)*

# Camera features



This chapter lists beginner, expert, and guru camera features, as seen from the frame grabber SDK.

## DeviceControl

Device control features provide general information and control for the device (camera) and its sensor. This feature group is mainly used to identify the device during the enumeration process and to obtain information about the sensor resolution. Other information and controls pertaining to the general state of the device are also included in this group.

### DeviceScanType

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Default</b>	<i>Areascan</i>
<b>Category</b>	/DeviceControl

The scan type of the sensor of the device. Bonito PRO cameras support area scan only.

### DeviceVendorName

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

Provides the name of the manufacturer of the device. *ALLied Vision* by default.

### DeviceModelName

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

Provides the model name of the device.

Example: *Bonito PRO X-2620B*

## DeviceFirmwareVersion

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The firmware version of the Bonito PRO camera.

Example: `00.00.01.020084`

## DeviceSerialNumber

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The string contains the serial number of the device. It can be used to identify the device. This string is a unique identifier for the device.

Example: `02-2880A-05000`

## DeviceID

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The string contains the serial number of the device.

## DeviceTemperatureSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Values</b>	<i>Mainboard, Sensor</i>
<b>Category</b>	/DeviceControl

Selects the location within the device where the temperature is measured.

Value	Description
<i>Mainboard</i>	Temperature of the image sensor of the camera.
<i>Sensor</i>	Temperature of the camera's mainboard.

## DeviceTemperature

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Unit</b>	Degree Celsius
<b>Accuracy</b>	±1 deg Celsius
<b>Category</b>	/DeviceControl

Reports the temperature in degrees Celsius. It is measured at the location selected by `DeviceTemperatureSelector`.

## DeviceUserID

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	String
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Default</b>	Empty string
<b>Category</b>	/DeviceControl

Used for multiple-camera applications for providing meaningful labels to individual cameras.

## DeviceReset

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Guru
<b>Default</b>	Empty string
<b>Category</b>	/DeviceControl

Resets the device to its power up state. After reset, the device must be rediscovered.

## DevicePartNumber

<b>Standard</b>	Custom
<b>Feature type</b>	String
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The Bonito PRO camera part number.

Example: 02-2885A

## FirmwareVerMajor

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The major part of the firmware version number (part before the decimal).

Example: 00.01.020084

## FirmwareVerMinor

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The minor part of firmware version number (part after the decimal).

Example: 00.**01**.020084

## FirmwareVerBuild

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The firmware version build information.

Example: 00.01.**020084**

## SensorType

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The type of image sensor. Monochrome or Bayer pattern color sensor type.

Examples: *Mono*, *Bayer*



## SensorBits

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

The maximum bit depth of sensor.

Example: 10

## DeviceFirmwareVersionSelector

<b>Standard</b>	Custom
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Values</b>	<i>Current, Programmed</i>
<b>Category</b>	/DeviceControl

Selects the **DeviceFirmwareVersion** to read.

Value	Description
<i>Current</i>	The firmware that is currently running on the device.
<i>Programmed</i>	Device firmware version stored in non-volatile memory. The firmware that is active after a restart.

## DeviceFirmwareID

<b>Standard</b>	Custom
<b>Feature type</b>	String
<b>Access</b>	Read only
<b>Visibility</b>	Expert
<b>Category</b>	/DeviceControl

Depending on the **DeviceFirmwareIDSelector**, this feature contains one or a list of firmware IDs of the camera.

## DeviceFirmwareIDSelector

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Values</b>	<i>Current, Supported</i>
<b>Category</b>	/DeviceControl

Selector for the firmware ID.

Value	Description
<i>Current</i>	Device firmware ID of the firmware being used by the camera.
<i>Supported</i>	Supported firmware IDs.

## DeviceFirmwareUploadType

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/DeviceControl

Type of the firmware upload. Indicator for different files (used during firmware upload).

## ImageFormatControl

This feature group includes features that influence and determine the image size and format. It also provides the necessary information to acquire and to display the image data. It assumes that the device has a source of data that generates a single rectangular image. This image can be entirely or partially streamed out of the device using one or more ROI.

### PixelFormat

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Mono8, Mono10, BayerRG8, BayerRG10</i>
<b>Category</b>	<i>/ImageFormatControl</i>

There are four pixel formats that Bonito PRO cameras can output.

Value	Description
<i>Mono8</i>	One pixel of data for every byte. Format: Monochrome Bit depth: 8-bit
<i>Mono10</i>	One pixel of data for every two bytes, LSB aligned. Format: Monochrome Bit depth: 10-bit
<i>BayerRG8</i>	No color interpolation. Interpolation performed by host software. Format: RAW Bit depth: 8-bit
<i>BayerRG10</i>	One pixel of data every for two bytes, LSB aligned. No color interpolation. Interpolation performed by host software. Format: RAW Bit depth: 10-bit

## Width

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The width of the image. The minimum supported width is 64 pixels.

## Height

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The height of the image. The minimum supported height is 16 pixels.

## SensorWidth

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/ImageFormatControl

The total number of pixel columns on the sensor.

## SensorHeight

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Category</b>	/ImageFormatControl

The total number of pixel rows on the sensor.

## WidthMax

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The maximum image width available for the current image mode.

## HeightMax

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Beginner
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The maximum image height for the current image mode.

## OffsetX

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Default</b>	0
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The starting column of the readout region (relative to the first column of the sensor). **OffsetX** must be configured in multiples of 64.

## OffsetY

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Default</b>	0
<b>Unit</b>	Pixels
<b>Category</b>	/ImageFormatControl

The starting row of the readout region (relative to the first row of the sensor). **OffsetY** must be configured in multiples of 16.

## MultipleROIEnable

<b>Standard</b>	<i>Custom</i>
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>True, False</i>
<b>Default</b>	<i>False</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Select to enable or disable multiple regions of interest.



### Multiple ROI application note

For more information on configuring multiple regions of interest, see the application note available on our documentation webpage.

[www.alliedvision.com/en/support/technical-documentation/bonito-pro-documentation.html](http://www.alliedvision.com/en/support/technical-documentation/bonito-pro-documentation.html)

## CondensedRegionStatus

<b>Standard</b>	<i>Custom</i>
<b>Feature type</b>	String
<b>Access</b>	Read
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>D, V, P, O</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Status of all regions.

Value	Description
<i>D</i>	Disabled
<i>V</i>	Valid
<i>P</i>	Position error
<i>O</i>	Overlap error

## RegionSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Region0, Region1, Region2, Region3</i>
<b>Default</b>	<i>Region0</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Selects the ROI to control. The **RegionSelector** feature allows devices that are able to extract multiple regions out of an image, to configure the features of those individual regions independently.

As multiple ROIs are supported by the device, the **RegionSelector** can be added to various features such as width and height to specify the behavior of the selected region.

Value	Description
<i>Region0</i>	Selected feature controls region 0.
<i>Region1</i>	Selected feature controls region 1.
<i>Region2</i>	Selected feature controls region 2.
<i>Region3</i>	Selected feature controls region 3.

## RegionMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Off, On</i>
<b>Default</b>	<i>On</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Controls if the selected region of interest is active and streaming.

Value	Description
<i>Off</i>	Disable the usage of the region.
<i>On</i>	Enable the usage of the region.



## RegionDestination

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Stream0, Stream1, Stream2, Stream3</i>
<b>Default</b>	<i>Stream0</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Controls the destination of the selected region.

Value	Description
<i>Stream0</i>	The destination of the region is data stream 0.
<i>Stream1</i>	The destination of the region is data stream 1.
<i>Stream2</i>	The destination of the region is data stream 2.
<i>Stream3</i>	The destination of the region is data stream 3.

## RegionIDValue

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>0, 1, 2, 3</i>
<b>Default</b>	<i>0</i>
<b>Category</b>	<i>/ImageFormatControl</i>

Returns a unique identifier value that corresponds to the selected region. This value is typically used by the transport layer to specify the region from which the transmitted data comes from.

## BinningHorizontal

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Default</b>	<b>1</b>
<b>Category</b>	<b>/ImageFormatControl</b>

The horizontal binning factor. Binning is the brightness value of adjacent pixels on a sensor, giving a lower resolution image, but at full resolution. Image sensitivity is also improved due to summed pixel charge.

## BinningVertical

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Default</b>	<b>1</b>
<b>Category</b>	<b>/ImageFormatControl</b>

The vertical binning factor. Binning is the brightness value of adjacent pixels on a sensor, giving a lower resolution image, but at full resolution. Image sensitivity is also improved due to summed pixel charge.

## BinningVerticalMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Possible values</b>	<i>Sum, Average</i>
<b>Default</b>	<i>Sum</i>
<b>Category</b>	<code>/ImageFormatControl</code>

Determines whether the result of binned pixels is averaged or summed. Changing **BinningVerticalMode** also changes **BinningHorizontalMode**.

Value	Description
<i>Sum</i>	Binning is accomplished by summing the value of adjacent pixels on sensor. The response from the combined pixels are added, resulting in increased sensitivity.
<i>Average</i>	Binning is accomplished by averaging the value of adjacent pixels on sensor. This increases SNR by SQRT (number of binned pixels).

## BinningHorizontalMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Possible values</b>	<i>Sum, Average</i>
<b>Default</b>	<i>Sum</i>
<b>Category</b>	<code>/ImageFormatControl</code>

Determines whether the result of binned pixels is averaged or summed. Changing **BinningHorizontalMode** also changes **BinningVerticalMode**.

Value	Description
<i>Sum</i>	Binning is accomplished by summing the value of adjacent pixels on sensor. The response from the combined pixels are added, resulting in increased sensitivity.
<i>Average</i>	Binning is accomplished by averaging the value of adjacent pixels on sensor. This increases SNR by SQRT (number of binned pixels).

## AcquisitionControl

The Acquisition Control feature group includes all features related to image acquisition, including the trigger and exposure control. It describes the basic model for acquisition and the typical behavior of the device.

### AcquisitionMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Continuous, SingleFrame, MultiFrame</i>
<b>Default</b>	<i>Continuous</i>
<b>Category</b>	/AcquisitionControl

Defines the number of frames to capture during an acquisition and the way the acquisition stops.

Value	Description
<i>Continuous</i>	After an acquisition start event, the camera continuously receives frame trigger events. See <b>TriggerSelector</b> and <b>TriggerSource</b> for more information.
<i>SingleFrame</i>	The camera only delivers a single frame trigger event. Further trigger events are ignored until acquisition is stopped and restarted.
<i>MultiFrame</i>	The camera acquires the number of images specified by <b>AcquisitionFrameCount</b> . Further trigger events are ignored until acquisition is stopped and restarted.

### AcquisitionStart

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/AcquisitionControl

Software command to start the camera receiving frame triggers. Valid if **TriggerMode** = *Off*. See **TriggerSelector** = *FrameStart* trigger.

## AcquisitionStop

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/AcquisitionControl

Software command to stop the camera from receiving frame triggers. Valid if **TriggerMode** = *Off*. See **TriggerSelector** = *FrameStart* trigger.

## AcquisitionAbort

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/AcquisitionControl

Aborts the acquisition immediately. This ends the capture without completing the current frame or waiting on a trigger, but the transfer of the current image is continued. If no acquisition is in progress, the command is ignored.

## AcquisitionFrameCount

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	1 to 65535
<b>Default</b>	1
<b>Unit</b>	Frames
<b>Category</b>	/AcquisitionControl

Defines the number of frames to capture in a limited sequence of images. Used with **AcquisitionMode** = *MultiFrame*.

## AcquisitionFrameRate

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Unit</b>	Hz
<b>Category</b>	/AcquisitionControl

Controls the frame rate at which the frames are captured.

Concerning the connection between **AcquisitionFrameRate** and other related values, there are a few durations that may influence the possible **AcquisitionFrameRate**, the exposure time, the sensor read-out time, and the transfer time.

**AcquisitionFrameRate** does not reflect the resulting acquisition rate on the host, it only controls the frame rate at which the frames are captured. The host acquisition speed may also be influenced by transfer control features.

If ExposureMode = <i>Timed</i>	Ensure $[1/\text{ExposureTime}^*] > \text{AcquisitionFrameRate}$ to achieve target frame rate.
If ExposureMode = <i>TriggerWidth</i>	Ensure $[1/(\text{external trigger pulse width})] > \text{AcquisitionFrameRate}$ to achieve target frame rate.
* ExposureTime in seconds	

## AcquisitionFrameRateLimit

<b>Standard</b>	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Unit</b>	Frames per second
<b>Category</b>	/AcquisitionControl

The maximum frame rate possible for the current exposure duration.

## TriggerSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>FrameStart, AcquisitionStart, AcquisitionEnd</i>
<b>Default</b>	<i>FrameStart</i>
<b>Category</b>	<i>/AcquisitionControl</i>

Selects the trigger that lets the camera resume to normal state of operation. If this trigger is not enable or the selected source is sent to auto-sleep, it might be necessary to power cycled the camera to resume. Select a trigger, then use the controls {**TriggerMode**, **TriggerSoftware**, **TriggerSource**, **TriggerActivation**, **TriggerDelay**} to setup and read the trigger features.

Value	Description
FrameStart	The trigger which starts each image (if acquisition is running).
AcquisitionStart	The trigger which starts the acquisition process.
AcquisitionEnd	The trigger which ends the acquisition process.

## TriggerMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Off, On</i>
<b>Default</b>	<i>On</i>
<b>Category</b>	<i>/AcquisitionControl</i>

Switches the trigger on or off for the selected acquisition feature.



If **TriggerMode** = *Off* and **TriggerSelector** = *FrameStart*, images triggered in *FixedRate* at *AcquisitionFrameRate*.

Value	Description
On	Enables the selected trigger.
Off	Disables the selected trigger.

## TriggerSoftware

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/AcquisitionControl

Triggers the selected acquisition feature if its source is set to **Software**. Valid if **TriggerSource = Software**.

## TriggerSource

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Freerun, Line0, Line1, FixedRate, Software, LinkTrigger0</i>
<b>Default</b>	<i>Freerun</i>
<b>Category</b>	/AcquisitionControl

Determines how an image frame is initiated within an acquisition stream. This might be a hardware trigger, a fixed rate generator, or software trigger only.



An acquisition stream must be started in order to trigger or receive individual frames. For **Freerun** and **FixedRate** the first frame is synchronized to **AcquisitionStart** trigger.

Value	Description
<i>Freerun</i>	Camera runs at maximum supported frame rate depending on the exposure time and ROI size.
<i>Line0</i>	External trigger <i>Line1</i>
<i>Line1</i>	External trigger <i>Line2</i>
<i>FixedRate</i>	Camera self-triggers at a fixed frame rate defined by <b>AcquisitionFrameRate</b> .
<i>Software</i>	Software initiated image capture.
<i>LinkTrigger0</i>	Specifies which link trigger to use as the source for the trigger (received from the transport layer).



## TriggerActivation

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>RisingEdge</i> , <i>FallingEdge</i> , <i>AnyEdge</i> , <i>LevelHigh</i> , <i>LevelLow</i>
<b>Default</b>	<i>RisingEdge</i>
<b>Category</b>	/AcquisitionControl

Feature type of activation, for hardware triggers. This feature controls edge, level, and polarity sensitivities.

Value	Description
<i>RisingEdge</i>	Specifies that the trigger is considered valid on the rising edge of the source signal.
<i>FallingEdge</i>	Specifies that the trigger is considered valid on the falling edge of the source signal.
<i>AnyEdge</i>	Specifies that the trigger is considered valid on the falling or rising edge of the source signal.
<i>LevelHigh</i>	Specifies that the trigger is considered valid as long as the level of the source signal is high.
<i>LevelLow</i>	Specifies that the trigger is considered valid as long as the level of the source signal is low.

## TriggerDelay

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Default</b>	0
<b>Unit</b>	Microseconds
<b>Category</b>	/AcquisitionControl

Start-of-image can be delayed to begin some time after a trigger event is received by the camera. This feature is valid only if **TriggerSource** is set to external trigger (*Line0*, *Line1*). This control is a commonly used trigger to synchronize with a strobe lighting source, which inherently has some fixed setup time. There could also be a **LineDelay** on the source.

## ExposureTime

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Camera dependent
<b>Unit</b>	Microseconds
<b>Category</b>	/AcquisitionControl

The sensor integration time. Values written to control are rounded to nearest multiple of **ExposureTimeIncrement**. Reading this control returns the used, rounded value.

**ExposureTime** depends on **ExposureMode** as follows:

If <b>ExposureMode</b> = <i>Timed</i>	Then <b>ExposureTime</b> is sensor integration time
If <b>ExposureMode</b> = <i>TriggerWidth</i>	Then <b>ExposureTime</b> is ignored

## ExposureMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Timed, TriggerWidth</i>
<b>Default</b>	<i>Timed</i>
<b>Category</b>	/AcquisitionControl

Sets the operation mode of the exposure.

Value	Description
<i>Timed</i>	Limed exposure. Camera exposure time is set by <b>ExposureTime</b> or <b>ExposureAuto</b> .
<i>TriggerWidth</i>	Uses the width of the current Frame or Line trigger signals pulse to control the exposure duration. Camera exposure time is controlled by external trigger pulse on <b>Line1</b> or <b>Line2</b> . In order for this feature to work, <b>TriggerSelector</b> = <b>FrameStart</b> and <b>TriggerSource</b> must be set to <b>Line1</b> or <b>Line2</b> .

## ExposureAuto

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Off, Once, Continuous</i>
<b>Default</b>	<i>Off</i>
<b>Category</b>	/AcquisitionControl

Auto algorithms use information from the camera's current image and apply the following settings to the next image. Significant changes in scene lighting may require several frames for the algorithm to stabilize.

Value	Description
<i>Off</i>	The automatic mode is off.
<i>Once</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . Auto-exposure occurs until target is achieved, then <b>ExposureAuto</b> returns to <i>Off</i> .
<i>Continuous</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . The exposure time varies continuously according to the scene illumination. The auto exposure function operates according to the <b>ExposureAuto</b> and <b>DSPSubregion</b> controls.

If using **ExposureAuto** = *Continuous*, and **GainAuto** = *Continuous* simultaneously, priority is given to changes in exposure until **ExposureAutoMax** is reached, at which point priority is given to changes in gain.

You can configure the auto exposure feature to respond only to a subregion within the image scene. This subregion can be configured with the **DSPSubregion** feature.



The camera must be acquiring images in order for the auto algorithm to update.

## ExposureAutoControl

This feature sub-group contains features for auto exposure.

### ExposureAutoTarget

Standard	Custom
Feature type	Integer
Access	Read/Write
Visibility	Beginner
Range	0 to 100 0 being black, 100 being white
Default	50
Unit	Percent
Category	/AcquisitionControl/ExposureAutoControl

The general brightness of the auto exposure feature; specifically the target mean histogram level of the image.



Higher values result in brighter images.

### ExposureAutoAlg

Standard	Custom
Feature type	Enumeration
Access	Read/Write
Visibility	Beginner
Possible values	Mean, FitRange
Default	Mean
Category	/AcquisitionControl/ExposureAutoControl

The following algorithms can be used to calculate auto exposure.

Value	Description
Mean	The arithmetic mean of the histogram of the current image is compared to <b>ExposureAutoTarget</b> , and the next image adjusted in exposure time to meet this target. Bright areas are allowed to saturate.
FitRange	The histogram of the current image is measured, and the exposure time of the next image is adjusted so that bright areas are not saturated.

## ExposureAutoMin

<b>Standard</b>	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Minimum: ExposureTime Maximum: ExposureAutoMax
<b>Default</b>	Minimum: ExposureTime
<b>Unit</b>	Microseconds
<b>Category</b>	/AcquisitionControl/ExposureAutoControl

The lower bound to the exposure setting in auto exposure mode.

## ExposureAutoMax

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Minimum: ExposureAutoMin Maximum: ExposureTime
<b>Default</b>	Minimum: ExposureTime
<b>Unit</b>	Microseconds
<b>Category</b>	/AcquisitionControl/ExposureAutoControl

The upper bound to the exposure setting in auto exposure mode. This is useful in situations where frame rate is important. This value would normally be set to something less than (as a rough estimate)  $1 \times 10^6 / (\text{desired frame rate})$ .

## ExposureAutoRate

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	1 to 100 1 (slowest) to 100 (fastest)
<b>Default</b>	100
<b>Unit</b>	Percent
<b>Category</b>	/AcquisitionControl/ExposureAutoControl

The rate at which the auto exposure function changes the exposure setting. 100% is auto exposure adjustments running at full speed, and 50% is half speed.

## ExposureAutoOutliers

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 1000
<b>Default</b>	0
<b>Unit</b>	0.01% where 1000 = 10%
<b>Category</b>	/AcquisitionControl/ExposureAutoControl

The total pixels from top of the distribution that are ignored by the auto exposure algorithm.



Number of upper outliers to discard before calculating exposure adjustments. This is in ten-thousandths of the number pixels in the image.

## ExposureAutoAdjustTolerance

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 50
<b>Default</b>	5
<b>Unit</b>	Percent
<b>Category</b>	/AcquisitionControl/ExposureAutoControl

Tolerance in variation from **ExposureAutoTarget** in which the auto exposure algorithm does not respond. It can be used to limit exposure setting changes to only significant variations in scene lighting.

## AnalogControl

Feature group that contains the analog control features.

### GainSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible value</b>	<i>ALL</i>
<b>Default</b>	<i>ALL</i>
<b>Category</b>	<i>/AnalogControl</i>

Gain is applied to all channels.

### Gain

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Default</b>	<i>0.0</i>
<b>Unit</b>	1 dB
<b>Category</b>	<i>/AnalogControl</i>

$$G_{dB} = 20 \log \left( \frac{V_{out}}{V_{in}} \right)$$

The gain setting applied to the sensor. For best image quality, the gain setting must be set to zero. However, in low-light situations, it may be necessary to increase the gain setting.



## GainAuto

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Off, Once, Continuous</i>
<b>Default</b>	<i>Off</i>
<b>Category</b>	/AnalogControl

Sets the automatic gain mode. Auto algorithms use information from the camera's current image and apply the following settings to the next image. Significant changes in scene lighting may require two to three frames for the algorithm to stabilize.



Auto algorithm adjusts using 1 dB gain steps. The camera must be acquiring images in order for the auto algorithm to update.

Value	Description
<i>Off</i>	The automatic mode is off.
<i>Once</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . Auto-gain occurs until target is achieved, then <b>GainAuto</b> returns to <i>Off</i> .
<i>Continuous</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . The gain varies continuously according to the scene illumination. The auto exposure function operates according to the <b>ExposureAutoControl</b> and <b>DSPSubregion</b> controls.

If using **ExposureAuto** = *Continuous* and **GainAuto** = *Continuous* simultaneously, priority is given to changes in exposure until **ExposureAutoMax** is reached, at which point priority is given to changes in gain.

You can configure the auto gain feature to respond only to a subregion within the image scene. This subregion can be configured with the **DSPSubregion** feature.

## GainAutoControl

This feature sub-group contains all auto gain features.

### GainAutoTarget

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 100
<b>Default</b>	50
<b>Unit</b>	Percent
<b>Category</b>	/AnalogControl/GainAutoControl

The general brightness of the auto gain feature. A percentage of maximum brightness.

### GainAutoMin

Standard	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 22.0
<b>Default</b>	0.0
<b>Unit</b>	dB
<b>Category</b>	/AnalogControl/GainAutoControl

The lower bound to the gain setting in auto gain mode.

### GainAutoMax

Standard	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 22.0
<b>Unit</b>	dB
<b>Category</b>	/AnalogControl/GainAutoControl

The upper bound to the gain setting in auto gain mode.

## GainAutoRate

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	1 to 100 1 (slowest) to 100 (fastest)
<b>Default</b>	100
<b>Unit</b>	Percent
<b>Category</b>	/AnalogControl/GainAutoControl

The rate at which the auto gain function changes. A percentage of the maximum rate.



Use this control to slow down the auto-gain adjustments.

## GainAutoOutliers

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 1000
<b>Default</b>	0
<b>Unit</b>	0.01%, where 1000 = 10%
<b>Category</b>	/AnalogControl/GainAutoControl

The total pixels from top of the image that are ignored by the auto gain algorithm.



Number of upper outliers to discard before calculating gain adjustments. This is in ten-thousandths of the number pixels in the image.

## GainAutoAdjustTolerance

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 50
<b>Default</b>	5
<b>Unit</b>	Percent
<b>Category</b>	/AnalogControl/GainAutoControl

Tolerance in variation from **GainAutoTarget** in which the auto exposure algorithm does not respond. This feature is used to limit auto gain changes to only larger variations in scene lighting.



This prevents needless small adjustments from affecting each image.

## BlackLevelSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Default</b>	All
<b>Category</b>	/AnalogControl

Set to **ALL**, **BlackLevel** is applied to all channels.

## BlackLevel

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Default</b>	0.0
<b>Category</b>	/AnalogControl

The black level value. Setting the **Gain** does not change the **BlackLevel**.

## BalanceRatioSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Red, Blue</i>
<b>Default</b>	<i>Red</i>
<b>Category</b>	<i>/AnalogControl</i>

Selects which balance ratio to control. To allow a white balance in a tinted illumination (red or blue), green component is controlled indirectly. Select the red or blue channel to adjust with **BalanceRatio**.

## BalanceRatio

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	<i>0.8 to 3</i>
<b>Category</b>	<i>/AnalogControl</i>

Controls ratio of the selected color component to a reference color component. It is used for white balancing.

Color balance is realized according to the following formula:

$$C_w = \text{BalanceRatio} \times C$$

where:

$C_w$  is the intensity of selected color component after white balancing.

**BalanceRatio** is the white balance coefficient.

$C$  is the intensity of the color component before white balancing.

Adjusts the gain of the channel selected in the **BalanceRatioSelector**.

**BalanceRatio** = 1 means no gain is applied.



The green channel gain is always 1, as this is the luminance or reference channel. To increase or decrease green, decrease or increase red and blue accordingly.

## BalanceWhiteAuto

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Off, Once, Continuous</i>
<b>Default</b>	<i>Off</i>
<b>Category</b>	<i>/AnalogControl</i>

Auto algorithms use information from the camera's current image and apply the following settings to the next image; for instance, the camera must be acquiring images for the auto algorithm to update. Significant changes in scene lighting may require two to three frames for the algorithm to stabilize.



The output of this auto function affects a single ROI only.

You can configure the auto white balance feature to respond only to a subregion within the image scene. This subregion can be configured with the **DSPSubregion** feature.

Value	Description
<i>Off</i>	Auto white balance is off. White balance can be adjusted directly by changing the <b>BalanceRatioSelector</b> and <b>BalanceRatio</b> .
<i>Once</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . A single iteration of the auto white balance algorithm is run, and then <b>BalanceWhiteAuto</b> returns to <i>Off</i> . The <i>Once</i> value operates according to the <b>ExposureAuto</b> and <b>DSPSubregion</b> controls.
<i>Continuous</i>	Valid if <b>ExposureMode</b> = <i>Timed</i> . White balance continuously adjusts according to the current scene. The <b>continuous</b> function operates according to the <b>ExposureAuto</b> and <b>DSPSubregion</b> controls.

## BalanceWhiteAutoControl

### BalanceWhiteAutoRate

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	1 to 100 1 (slowest) to 100 (fastest)
<b>Default</b>	100
<b>Unit</b>	Percent
<b>Category</b>	/AnalogControl/BalanceWhiteAutoControl

The rate of white balance adjustments. It is used to slow the rate of color balance change so that only longer period fluctuations affect color.



The output of this auto function affects a single ROI only.

### BalanceWhiteAutoAdjustTolerance

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to 50
<b>Default</b>	5
<b>Unit</b>	Percent
<b>Category</b>	/AnalogControl/BalanceWhiteAutoControl

Tolerance allowed from the ideal white balance values, within which the auto white balance does not run. It is used to limit white balance setting changes to only larger variations in color.



This prevents needless small adjustments from affecting each image.

## Gamma

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Default</b>	1.0
<b>Unit</b>	Output = (Input) <sup>Gamma</sup>
<b>Category</b>	/AnalogControl

Gamma controls the mode for automatic white balancing between the color channels. The white balancing ratios are automatically adjusted. Controls the gamma correction of pixel intensity. This is typically used to compensate for non-linearity of the display system (nonlinear brightness control). Applies gamma value to the raw sensor signal (via LUT).

Value	Description
1.0	Gamma OFF (no Gamma correction)
Values other than 1.0	Gamma ON

If **Gamma** is **OFF**, LUT position 1 contains optional user defined LUT values.



Bonito PRO models have a standalone gamma correction function which does not share resources with LUTs.



## DSPSubregion

The automatic exposure, gain, and white balance features can be configured to respond only to a subregion within the image scene. This feature can be used to choose a subregion that meters the rest of the image. This feature works like the region metering on a photographic camera.

### DSPSubregionSelector

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Region0, Region1, Region2, Region3</i>
<b>Default</b>	<i>Region0</i>
<b>Category</b>	/AnalogControl/DSPSubregion

Selects the DSP subregion to control.

### DSPSubregionLeft

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to sensor width
<b>Default</b>	0
<b>Category</b>	/AnalogControl/DSPSubregion

Defines the left edge of the DSP subregion.

### DSPSubregionTop

Standard	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to sensor height
<b>Default</b>	0
<b>Category</b>	/AnalogControl/DSPSubregion

Defines the top edge of the DSP subregion.

## DSPSubregionRight

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to sensor width
<b>Default</b>	<i>Sensor width</i>
<b>Category</b>	/AnalogControl/DSPSubregion

Defines the right edge of the DSP subregion.



For convenience, this value may be higher than the maximum width.

## DSPSubregionBottom

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	0 to sensor height
<b>Default</b>	<i>Sensor height</i>
<b>Category</b>	/AnalogControl/DSPSubregion

Defines the bottom edge of the DSP subregion.



The DSP subregion is the area of the image used for measurements in "auto" functions such as auto-exposure and auto-gain. **DSPSubregionLeft** is the bottom row, relative to the current image region. For convenience, this value may be higher than the maximum height.

## DSPSubregionEnable

<b>Standard</b>	Custom
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>On, Off</i>
<b>Default</b>	<i>On</i>
<b>Category</b>	/AnalogControl/DSPSubregion

Controls if the selected DSP subregion is active.

## LUTControl

Use of a LUT allows any function (in the form **Output** = F(Input)) to be stored in the camera's memory and to be applied on the individual pixels of an image at runtime.

## LUTSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>LUT1, LUT2, LUT3</i>
<b>Default</b>	<i>LUT1</i>
<b>Category</b>	/LUTControl

Selects which LUT is used.

Value	Description
<i>LUT1</i>	Selects the first LUT.
<i>LUT2</i>	Selects the second LUT.
<i>LUT3</i>	Selects the third LUT.

## LUTInfo

This feature sub-group provides active LUT information.

### LUTBitDepthIn

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Guru
<b>Category</b>	/LUTControl/LUTInfo

The bit depth of the input value of the LUT transformation.

### LUTBitDepthOut

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Guru
<b>Category</b>	/LUTControl/LUTInfo

The bit depth of the output value of the LUT transformation.

### LUTAddress

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Guru
<b>Category</b>	/LUTControl/LUTInfo

Indicates location of memory, if a LUT is loaded.

### LUTSizeBytes

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only (Constant)
<b>Visibility</b>	Guru
<b>Category</b>	/LUTControl/LUTInfo

The memory size of the active LUT.

## LUTMode

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>Luminance, Red, Green, Blue</i>
<b>Default</b>	<i>Luminance</i>
<b>Category</b>	<i>/LUTControl</i>

Selects on which pixels the selected LUT (depending on **LUTSelector**) is applied.

Value	Description
<i>Luminance</i>	LUT is applied on all pixels.
<i>Red</i>	LUT is applied on red pixels only.
<i>Green</i>	LUT is applied on green pixels only.
<i>Blue</i>	LUT is applied on blue pixels only.



We recommend the following steps:

1. Configure the LUT modes
2. Enable the LUT

## LUTEnable

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>true, false</i>
<b>Default</b>	<i>false</i>
<b>Category</b>	<i>/LUTControl</i>

Enables or disables the selected LUT.

## LUTIndex

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Range</b>	0 to $(2^{\text{LUTBitDepthIn}} - 1)$
<b>Default</b>	0
<b>Category</b>	/LUTControl

Controls the index (offset) of coefficient to access in the selected LUT. This feature is used as a selector for **LUTValue** only.

## LUTValue

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Range</b>	0 to $(2^{\text{LUTBitDepthOut}} - 1)$
<b>Default</b>	Camera dependent
<b>Category</b>	/LUTControl

Returns or sets the value at entry **LUTIndex** of the LUT selected by **LUTSelector**.

## LUTLoadAll

<b>Standard</b>	Custom
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Expert
<b>Category</b>	/LUTControl

Loads the LUT from flash memory into volatile memory of the camera.

## LUTSaveAll

<b>Standard</b>	Custom
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Expert
<b>Category</b>	/LUTControl

Saves the LUT from volatile memory into flash memory of the camera.



With **UserSets** control (**UserSetSave** command) you cannot save the contents of the LUT.

## TransportLayerControl

### PayloadSize

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Unit</b>	Bytes
<b>Category</b>	/TransportLayerControl1

Provides the number of bytes transferred for each image on the stream channel. This includes any end-of-line, end-of-frame statistics, or other stamp data. This is the total size of data payload for a data block.

This feature is mainly used by the application software to determine size of image buffers to allocate (largest buffer possible for current mode of operation).

### NonImagePayloadSize

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Unit</b>	Bytes
<b>Category</b>	/TransportLayerControl1

Feature is not supported.



## DeviceTapGeometry

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Expert
<b>Possible Values</b>	<i>Geometry_1X_1Y</i>
<b>Default</b>	<i>Geometry_1X_1Y</i>
<b>Category</b>	/TransportLayerControl1

This device tap geometry feature defines the geometrical properties characterizing the taps of a camera as presented at the output of the device.

Value	Description
<i>Geometry_1X_1Y</i>	Geometry_1X_1Y is area scan geometry with 1 zone in X and 1 zone in Y.

## CoaXPress

This sub-category contains the features pertaining to the CoaXPress transport layer of the device.

### CxpConnectionTestMode

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>On, Off</i>
<b>Category</b>	/TransportLayerControl1/CoaXPress

Enables or disables the test mode for physical connection of the device.

### CxpConnectionSelector

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	Minimum: <i>0</i> Maximum: <i>3</i>
<b>Category</b>	/TransportLayerControl1/CoaXPress

Selects the CoaXPress physical connection to control.

### CxpConnectionTestErrorCount

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Expert
<b>Category</b>	/TransportLayerControl/CoaXPress

Reports the current connection error count for test packets received by the device on the connection selected by **CxpConnectionSelector**.

### CxpConnectionPacketCountTx

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Expert
<b>Category</b>	/TransportLayerControl/CoaXPress

Reports the current count for test packets transmitted by the device on the connection selected by **CxpConnectionSelector**.

### CxpConnectionPacketCountRx

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Expert
<b>Category</b>	/TransportLayerControl/CoaXPress

Reports the current count for test packets received by the device on the connection selected by **CxpConnectionSelector**.

## FileAccessControl

This feature group contains the file access control features.

### FileSelector

<b>Standard</b>	GenICam SFNC Version 2.2 (modified SFNC feature)
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Firmware, UserData</i>
<b>Category</b>	/FileAccessControl

Selects the target file in the device. The entries of this enumeration define the names of all files in the device that can be accessed via the file access.

Custom values are formatted *red*.

Value	Description
<i>Firmware</i>	A firmware bundle
<i>UserData</i>	A part of the camera memory that the user can write to

### FileOperationSelector

<b>Standard</b>	GenICam SFNC Version 2.2 (modified SFNC feature)
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Open, Close, Read, Write, Delete, WriteType, WriteAttribute, WriteDescription</i>
<b>Category</b>	/FileAccessControl

Selects the target operation for the selected file in the device. This operation is executed when the **FileOperationExecute** feature is called.

Custom values are formatted *red*.

Value	Description
<i>Open</i>	Opens the file selected by <b>FileSelector</b> in the device. The access mode in which the file is opened is selected by <b>FileOpenMode</b> .
<i>Close</i>	Closes the file selected by <b>FileSelector</b> in the device.

Value	Description
<i>Read</i>	Reads <b>FileAccessLength</b> bytes from the device storage at the file relative offset <b>FileAccessOffset</b> into <b>FileAccessBuffer</b> .
<i>Write</i>	Writes <b>FileAccessLength</b> bytes taken from the <b>FileAccessBuffer</b> into the device storage at the file relative offset <b>FileAccessOffset</b> .
<i>Delete</i>	Deletes the file selected by <b>FileSelector</b> in the device. Note that deleting a device file should not remove the associated <b>FileSelector</b> entry to allow future operation on this file.
<i>WriteType</i>	Applies the type stored in <b>FileTypeBuffer</b> to the currently selected file.
<i>WriteAttribute</i>	Applies the attribute stored in <b>FileAttributeBuffer</b> to the currently selected file.
<i>WriteDescription</i>	Applies the description stored in <b>FileDescriptionBuffer</b> to the currently selected file.

## FileOperationExecute

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Category</b>	<b>/FileAccessControl</b>

Executes the operation selected by **FileOperationSelector** on the selected file. When executing an operation the host has to provide the **FileSelector** and **FileOpenMode** along with the **FileOperationSelector**.

## FileOpenMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Read, Write, ReadWrite</i>
<b>Category</b>	/FileAccessControl

Selects the access mode in which a file is opened in the device.

Value	Description
<i>Read</i>	This mode selects read-only open mode.
<i>Write</i>	This mode selects write-only open mode.

## FileAccessBuffer

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Register
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Possible values</b>	<i>Device Specific</i>
<b>Category</b>	/FileAccessControl

Defines the intermediate access buffer that allows the exchange of data between the device file storage and the application. This register mapped **FileAccessBuffer** must be written with the target data before executing a write operation. For read operation, the data can be read from the **FileAccessBuffer** after the read operation has been executed. The effective data transfer is done upon **FileOperationExecute** execution.

## FileAccessOffset

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Possible values</b>	$\geq 0$
<b>Unit</b>	Bytes
<b>Category</b>	/FileAccessControl

Controls the offset of the mapping between the device file storage and the **FileAccessBuffer**. The **FileAccessOffset** defines the offset in bytes of the **FileAccessBuffer** relative to the beginning of the selected file. This feature is available only when **FileOperationSelector** is set to *Read* or *Write*.

## FileAccessLength

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Possible values</b>	$\geq 0$
<b>Unit</b>	Bytes
<b>Category</b>	/FileAccessControl

Controls the length of the mapping between the device file storage and the **FileAccessBuffer**. The **FileAccessLength** defines the number of bytes to transfer to or from the **FileAccessBuffer**. This feature is available only when **FileOperationSelector** is set to *Read* or *Write*.

## FileOperationStatus

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Possible values</b>	<i>Success, Failure</i>
<b>Category</b>	<i>/FileAccessControl</i>

Represents the file operation execution status. Upon execution of a successful file operation, it must return **Success**. In case of complete or partial failure of the operation, other return values can be defined to indicate the nature of the error that happened. If only one fail status is defined, it should be defined as **Failure**.

Value	Description
<i>Success</i>	File operation was successful.
<i>Failure</i>	File operation failed.

## FileOperationResult

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Category</b>	<i>/FileAccessControl</i>

Represents the file operation result. For Read or Write operations, the number of successfully read/written bytes is returned.

## FileSize

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Possible values</b>	$\geq 0$
<b>Unit</b>	Bytes
<b>Category</b>	<i>/FileAccessControl</i>

Displays the size of the selected file in bytes

## FileOpenAttribute

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Overwrite, Append</i>
<b>Category</b>	/FileAccessControl

Selects the attribute of the write access mode in which a file is opened in the device.

Value	Description
<i>Overwrite</i>	The file overwrites the internal target.
<i>Append</i>	The file is appended to the internal target.

## FileStatus

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Possible values</b>	<i>Open, Closed</i>
<b>Category</b>	/FileAccessControl

Represents the status of the selected file.

Value	Description
<i>Open</i>	Selected file is open.
<i>Closed</i>	Selected file is closed.



## FileSystemFormat

<b>Standard</b>	Custom
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>True, False</i>
<b>Category</b>	/FileAccessControl

Initializes the file system for the first use.

Value	Description
<i>True</i>	The feature is enabled.
<i>False</i>	The feature is disabled.



This feature removes all data currently stored in the file system.

## FileSystemFormattingProgress

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/FileAccessControl

Returns the progress of the formatting procedure in percent. Equals 100 if no formatting is currently active.

## FileType

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Category</b>	/FileAccessControl

The **FileType** register provides information about the file type.

## FileTypeBuffer

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Category</b>	/FileAccessControl

The **FileTypeBuffer** register gives access to the buffer to exchange data between camera and host application.

## FileAttribute

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Values</b>	Byte[0]=0x00-> File owner = User Byte[0]=0x01-> File owner = Factory Byte[0]=0x02-> File owner = Developer
<b>Category</b>	/FileAccessControl

The **FileAttribute** register is used to store attributes for a given file or used to implement a privilege system. A file can only be read and written if the user is from the same user group as stored in the attribute field. It can be used to protect factory files from manipulation. The user group is set via a secret register.

## FileAttributeBuffer

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Category</b>	/FileAccessControl

The **FileAttributeBuffer** register gives access to the buffer to exchange data between camera and host application.

## FileDescription

Standard	Custom
<b>Feature type</b>	String
<b>Access</b>	Read only
<b>Visibility</b>	Guru
<b>Values</b>	Contains further information of a file, for example Low Gain, 50 ms, 30 deg Celsius Maximum 32 characters including trailing NULL
<b>Category</b>	/FileAccessControl

The **FileDescription** register provides a description string for a file.

## FileDescriptionBuffer

Standard	Custom
<b>Feature type</b>	String
<b>Access</b>	Read/Write
<b>Visibility</b>	Guru
<b>Values</b>	Maximum 32 characters including trailing NULL
<b>Category</b>	/FileAccessControl

The **FileDescriptionBuffer** register gives access to the buffer to exchange data between camera and host application.

## SequencerControl

This feature group contains the features related to sequencer control. This group includes the features related to the control of the sequencers that can be used to change some features of the camera automatically based on different events and signals.

The purpose of a sequencer is to allow the user of a camera to define a series of feature sets for image acquisition which can consecutively be activated during the acquisition by the camera. Accordingly, the proposed sequence is configured by a list of parameter sets.

Each of these sequencer sets contains the settings for a number of camera features. Similar to user sets, the actual settings of the camera are overwritten when one of these sequencer sets is loaded. The order in which the features are applied to the camera is defined by Allied Vision. It is recommended to apply all the image related settings to the camera, before the first frame of this sequence is captured.

Sequencer sets can be loaded and saved by selecting them using **SequencerSetSelector**. The execution of the sequencer is completely controlled by the device.

The sequencer set is a collection of features defining an image frame (for example, **Exposure**, **Gain**, **BlackLevel**, **PixelFormat**, **Region**, **FrameCount**, **Gamma**, **LUTControl**). All sequencer sets (16) contain a default configuration (unless modified using **SequencerSetSave**). Sequencer sets are saved in non-volatile memory.



Pixel format cannot be changed during sequencer control. This is a limitation of the frame grabber.



### Sequence Control application note

For more information on configuring sequence control, see the application note available on our documentation webpage.

[www.alliedvision.com/en/support/technical-documentation/bonito-pro-documentation.html](http://www.alliedvision.com/en/support/technical-documentation/bonito-pro-documentation.html)

## SequencerConfigurationMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>On, Off</i>
<b>Category</b>	/SequencerControl

Controls if the sequencer configuration mode is enabled or disabled. **SequencerConfigurationMode** must be set to *On* to configure the sequencer.

Available only if **SequencerMode** is set to *Off*, and no binning or decimation is currently enabled.

Value	Description
<i>Off</i>	Disables the sequencer configuration mode
<i>On</i>	Enables the sequencer configuration mode

## SequencerMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>On, Off</i>
<b>Category</b>	/SequencerControl

Controls if the sequencer mechanism is active. **SequencerMode** must be set to *On* for sequencer operation to be in effect.

Available only if **SequencerConfigurationMode** is set to *Off*, no binning or decimation is enabled, and the camera is not streaming.

Value	Description
<i>Off</i>	Disables the sequencer
<i>On</i>	Enables the sequencer

## SequencerFrameRate

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Unit</b>	Frames per second
<b>Category</b>	/SequencerControl1

Sequencer frame rate, in frames per second. This is applicable when either the **FrameStart** trigger mode is disabled, or the **FrameStart** trigger source is *FixedRate*. Any value up to **SequencerFrameRateLimit** is accepted.

## SequencerMaxFrameRate

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Unit</b>	Frames per second
<b>Category</b>	/SequencerControl1

Sequencer frame rate limit, in frames per second. This is a calculation of the maximum achievable frame rate based on current active sequencer sets.

## SequencerSetSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Category</b>	/SequencerControl1

Selects the **SequencerSet** to which further feature settings applies.

Available only if **SequencerConfigurationMode** is set to *On*.

## SequencerSetActive

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Category</b>	/SequencerControl

Contains the currently active **SequencerSet**.

Available only if **SequencerMode** is set to *On*. Shows which sequencer set is currently in use.

## SequencerSetLoad

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	(Read)/Write
<b>Visibility</b>	Expert
<b>Category</b>	/SequencerControl

Loads the **SequencerSet** selected by **SequencerSetSelector** in the device. Even if **SequencerMode** is set to *Off*, this changes the device state to the configuration of the selected set.

## SequencerSetSave

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	(Read)/Write
<b>Visibility</b>	Expert
<b>Category</b>	/SequencerControl

Saves the current device state to the **SequencerSet** selected by the **SequencerSetSelector**. The **SequencerSet** is loaded from non-volatile memory.

Available only if **SequencerConfigurationMode** is set to *On* and if camera is not streaming. This is similar in operation as **UserSetLoad** except that only a subset of the camera settings are loaded.

## SequencerSetStart

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Category</b>	/SequencerControl

Sets the initial or start **SequencerSet**, which is the first set used within a sequencer.

Available only if **SequencerConfigurationMode** is set to *On*. **SequencerSetEnd** is automatically adjusted if **SequencerSetStart** is greater than **SequencerSetEnd**.

## SequencerSetEnd

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Category</b>	/SequencerControl

Sets the final or end **SequencerSet**, which is the last set used within a sequencer.

Available only if **SequencerConfigurationMode** is set to *On*. Once **SequencerSetFrameCount** frames are captured from the **SequencerSet** specified by **SequencerSetEnd** the sequencer resumes operation using the **SequencerSet** specified by **SequencerSetStart**.

## SequencerSetFrameCount

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Range</b>	$\geq 0$
<b>Category</b>	/SequencerControl

Sets the number of frames captured by the **SequencerSet** selected by **SequencerSetSelector** before the sequencer advances to the next sequential **SequencerSet**.



## SequencerSetGammaEnable

<b>Standard</b>	<i>Custom</i>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>On, Off</i>
<b>Category</b>	/SequencerControl

Controls if the current gamma setting is applied to the **SequencerSet** selected by **SequencerSetSelector**.

Available only if **SequencerConfigurationMode** is set to *On*.

## UserSetControl

Bonito PRO cameras are capable of storing eight user-specified configurations within the camera's non-volatile memory. These saved configurations can be used to define the power up settings of the camera or to quickly switch between a number of predefined settings.

### UserSetSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Default, UserSet1, UserSet2, UserSet3, UserSet4, UserSet5, UserSet6, UserSet7, UserSet8</i>
<b>Category</b>	<i>/UserSetControl1</i>

Selects a feature user set to load, save, or configure.

Value	Description
<i>Default</i>	Select the factory setting user set. If <i>Default</i> is selected, the device starts with the default factory settings and makes sure the continuous acquisition use case works directly. The default user set is read only and cannot be modified.
<i>UserSet1, UserSet2, UserSet3, UserSet4, UserSet5, UserSet6, UserSet7, UserSet8</i>	Select the user set.

### UserSetLoad

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	<i>/UserSetControl1</i>

Loads camera parameters from the user set specified by **UserSetSelector** and makes it active.

## UserSetSave

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/UserSetControl1

Saves camera parameters to the user set specified by **UserSetSelector**. The **Default** setting cannot be overwritten.

## UserSetDefaultSelector

<b>Standard</b>	GenICam SFNC Version 2.2 (Deprecated)
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Default, UserSet1, UserSet2, UserSet3</i>
<b>Category</b>	/UserSetControl1

This feature is deprecated. Selects the feature user set to load and make active when the device is reset.

Value	Description
<i>Default</i>	Select the factory setting user set. If <b>Default</b> is selected, the device starts with the default factory settings and makes sure the continuous acquisition use case works directly.
<i>UserSet1, UserSet2, UserSet3, UserSet4, UserSet5, UserSet6, UserSet7, UserSet8</i>	Select the user set.

## DigitalIOControl

This feature group contains the features related to the control of the general I/O pins of the device.

### LineSelector

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>Line0, Line1, Line2, Line3, Line4, Line5</i>
<b>Category</b>	<i>/DigitalIOControl</i>

Selects the physical line (or pin) of the external device connector or the virtual line of the transport layer to configure. When a line is selected, all the other line features are applied to its associated I/O control block and conditions the resulting I/O signal. *Line0* and *Line1* are input and *Line2* to *Line5* are output.

Value	Description
<i>Line0, Line1, Line2, Line3, Line4, Line5</i>	Index of the physical line and associated I/O control block to use.

### LineMode

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>Input, Output</i>
<b>Category</b>	<i>/DigitalIOControl</i>

Controls if the physical line is used to input or output a signal. When a line supports I/O mode, the default state is Input to avoid possible electrical contention.

Value	Description
<i>Input</i>	The selected physical line is used to input an electrical signal.
<i>Output</i>	The selected physical line is used to output an electrical signal.

## LineInverter

<b>Standard</b>	GenICam SFNC Version 2.2
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>false, true</i>
<b>Category</b>	/DigitalIOControl

Controls the inversion of the signal of the selected I/O line.

Value	Description
<i>false</i>	The line signal is not inverted.
<i>true</i>	The line signal is inverted.

## LineSource

<b>Standard</b>	GenICam SFNC Version 2.2 (modified SFNC feature)
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>GPO, AcquisitionTriggerWait, FrameTriggerWait, ExposureActive, ReadoutActive, Imaging, FrameActive, Line0Signal, Line1Signal, Strobe1</i>
<b>Category</b>	/DigitalIOControl

Selects which internal acquisition or I/O source signal to output on the selected line. **LineMode** must be set to **Output**. For lines configured as input (dedicated or selectable), writing this feature has no effect (if it is available at all).

Custom values are formatted *red*.

Value	Description
<i>GPO</i>	General purpose output. The level of the output is set by <b>LineOutLevels</b> .
<i>AcquisitionTriggerWait</i>	Device is currently waiting for a trigger for the capture of one or many frames.
<i>FrameTriggerWait</i>	Device is currently waiting for a frame start trigger.
<i>ExposureActive</i>	Device is doing the exposure of a frame (or line).
<i>ReadoutActive</i>	Device is currently reading out from the sensor after the exposure has ended.
<i>Imaging</i>	Exposure or frame readout in progress.

Value	Description
<i>FrameActive</i>	Acquisition is running.
<i>Line0Signal</i>	External Line0 input signal.
<i>Line1Signal</i>	External Line1 input signal.
<i>Strobe1</i>	The source of output is from <b>Strobe1</b> .

## LineDebounceTimeDescription

<b>Standard</b>	<i>Custom</i>
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	0 to 50
<b>Category</b>	/DigitalIOControl

Debounces the signal of an input line; the signal must be stable for the specified amount of time in microseconds before it is provided to the camera internal logic.

## StrobeSelector

<b>Standard</b>	<i>Custom</i>
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>Strobe1, Strobe2, Strobe3, Strobe4</i>
<b>Default value</b>	<i>Strobe1</i>
<b>Category</b>	/DigitalIOControl

Select the **LineDuration** to control with {**LineDurationMode**, **LineDelay**, **LineDurationMinimum**}.

Value	Description
<i>Strobe1, Strobe2, Strobe3, Strobe4</i>	Selector values for different strobe sources.

## StrobeSource

<b>Standard</b>	Custom
<b>Feature type</b>	Enumeration
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>AcquisitionTriggerWait, FrameTriggerWait, FrameTrigger, ExposureActive, ReadoutActive, FrameActive, Line0Signal, Line1Signal</i>
<b>Category</b>	/DigitalIOControl

Signal source of the **LineDuration** timing unit.

Value	Description
<i>AcquisitionTriggerWait</i>	Camera is currently waiting for a trigger for the capture of one or many frames.
<i>FrameTriggerWait</i>	Camera is currently waiting for a frame start trigger.
<i>FrameTrigger</i>	This is the logic trigger signal inside of the camera. It is initiated by an external trigger or software trigger.
<i>ExposureActive</i>	Exposure in progress.
<i>ReadoutActive</i>	Camera is currently reading out from the sensor after exposure has ended.
<i>FrameActive</i>	Exposing or frame readout. Active if the camera is exposing or reading out frame data.
<i>Line0Signal</i>	External <b>Line0</b> input signal.
<i>Line1Signal</i>	External <b>Line1</b> input signal.

## StrobeDurationMode

<b>Standard</b>	Custom
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Possible values</b>	<i>On, Off</i>
<b>Default value</b>	<i>Off</i>
<b>Category</b>	/DigitalIOControl

Switches the **LineDurationMinimum** feature for a particular output line on or off.

Value	Description
<i>On</i>	<b>LineDurationMinimum</b> sets the strobe duration.
<i>Off</i>	Strobe duration is the same as source duration.

## StrobeDelay

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Default value</b>	0
<b>Unit</b>	Microseconds
<b>Category</b>	/DigitalIOControl

Specified the delay in microseconds to forward the line signal.

## StrobeDuration

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Default value</b>	0
<b>Unit</b>	Microseconds
<b>Category</b>	/DigitalIOControl

Specifies the minimum time a signal is provided at the output line.



## LineOutLevels

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Expert
<b>Default value</b>	0
<b>Category</b>	/DigitalIOControl

Output levels of hardware sync outputs, for outputs in GPO mode.



**LineInverter** can invert these values.

## LensControl

This feature group includes all lens control features.

### EFLensControl

The feature sub-group includes features related to EF lens control in Bonito PRO cameras with an integrated EF-Mount (order option-18).

#### EFLensFStop

##### EFLensFStopCurrent

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Float
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	EFLensFStopMin to EFLensFStopMax
<b>Unit</b>	Microseconds
<b>Category</b>	/LensControl/EFLensControl1/EFLensFStop

The current F-stop number or aperture of the EF lens.

##### EFLensFStopDecrease

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFStop

Decrease F-stop number, that is, increase lens aperture by the EFLensFStopStepSize.

##### EFLensFStopIncrease

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFStop

Increase F-stop number, that is, reduce lens aperture by the EFLensFStopStepSize.

### EFLensFStopMax

<b>Standard</b>	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Unit</b>	F-Stop
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFStop

The maximum possible F-stop setting or the smallest possible aperture for the EF lens based on current zoom setting.

### EFLensFStopMin

<b>Standard</b>	Custom
<b>Feature type</b>	Float
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Unit</b>	F-Stop
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFStop

The minimum possible F-stop setting or the largest possible aperture for the EF lens based on current zoom setting.

### EFLensFStopStepSize

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	1 to 8
<b>Unit</b>	F-Stop/8
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFStop

Size of increments or decrements in **EFLensFStopCurrent** if using **EFLensFStopIncrease** and **EFLensFStopDecrease** commands, respectively.

## EFLensFocus

### EFLensFocusCurrent

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	EFLensFocusMin to EFLensFocusMax
<b>Category</b>	/LensControl/EFLensControl/EFLensFocus

The current focus setting.

### EFLensFocusDecrease

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl/EFLensControl/EFLensFocus

Decrease or shorten focus distance by **EFLensFocusStepSize**.

### EFLensFocusIncrease

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl/EFLensControl/EFLensFocus

Increase or lengthen focus distance by **EFLensFocusStepSize**.

### EFLensFocusMax

<b>Standard</b>	<b>Custom</b>
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Category</b>	/LensControl/EFLensControl/EFLensFocus

The maximum or farthest possible focus setting.

### EFLensFocusMin

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFocus

The minimum or nearest possible focus setting.

### EFLensFocusStepSize

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Range</b>	Lens dependent
<b>Default</b>	10
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFocus

Size of increments or decrements in **EFLensFocusCurrent** if using **EFLensFocusIncrease** and **EFLensFocusDecrease** commands, respectively.

### EFLensFocusSwitch

<b>Standard</b>	Custom
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>AutoFocus</i> , <i>ManualFocus</i>
<b>Category</b>	/LensControl1/EFLensControl1/EFLensFocus

The current position of lens auto focus or manual focus switch.

Value	Description
<i>AutoFocus</i>	Switch is in auto focus position
<i>ManualFocus</i>	Switch is in manual focus position



All controls under **EFLensFocus** become read-only if the lens auto focus or manual focus switch is set to manual focus.

## EFLensInitialize

<b>Standard</b>	Custom
<b>Feature type</b>	Command
<b>Access</b>	Write
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl/EFLensControl

Initializes the EF lens. This command is automatically executed on power up and/or if lens is attached to camera.

## EFLensStatus

### EFLensID

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl/EFLensControl/EFLensStatus

The identification value of the attached EF lens.

### EFLensLastError

<b>Standard</b>	Custom
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Possible values</b>	<i>EFLensErrNone, EFLensErrQuery, EFLensErrInternal1, EFLensErrInternal2, EFLensErrBusy, EFLensErrZeroStop, EFLensErrInfinityStop</i>
<b>Category</b>	/LensControl/EFLensControl/EFLensStatus

The most recently detected error.

Value	Description
<i>EFLensErrNone</i>	No error detected.
<i>EFLensErrQuery</i>	Lens failed query by camera.
<i>EFLensErrInternal1</i>	Lens communication error (can occur when removing lens).

Value	Description
<i>EFLensErrInternal2</i>	Lens communication error (can occur when removing lens).
<i>EFLensErrBusy</i>	Lens remained busy for longer than 10 seconds.
<i>EFLensErrZeroStop</i>	Lens focus “Zero Stop” not detected.
<i>EFLensErrInfinityStop</i>	Lens focus “Infinity Stop” not detected.

#### EFLensState

<b>Standard</b>	Custom
<b>Feature type</b>	Enumeration
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Category</b>	/LensControl/EFLensControl/EFLensStatus

The current EF lens state.

State	Description
<i>EFLensIdle</i>	No lens action in progress.
<i>EFLensBusy</i>	Lens is busy (changing focus or aperture).
<i>EFLensWaiting</i>	Camera is waiting for lens attachment.
<i>EFLensInitializing</i>	Camera is initializing lens.
<i>EFLensError</i>	Lens Error detected. Error type is indicated by <b>EFLensLastError</b> . Remains in this state until <b>EFLensInitialize</b> is executed.

#### EFLensZoom

##### EFLensZoomCurrent

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Range</b>	<i>EFLensZoomMin</i> to <i>EFLensZoomMax</i>
<b>Units</b>	Millimeters
<b>Category</b>	/LensControl/EFLensControl/EFLensZoom

The current focal length of the EF lens.

#### EFLensZoomMax

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Units</b>	Millimeters
<b>Category</b>	/LensControl1/EFLensControl1/EFLensZoom

The maximum focal length of the EF lens.

#### EFLensZoomMin

<b>Standard</b>	Custom
<b>Feature type</b>	Integer
<b>Access</b>	Read only
<b>Visibility</b>	Beginner
<b>Default</b>	Lens dependent
<b>Units</b>	Millimeters
<b>Category</b>	/LensControl1/EFLensControl1/EFLensZoom

The minimum focal length of the EF lens.



## CorrectionControl

This feature group contains the fixed pattern noise correction feature.

### FpncControls

The feature sub-group describes the fixed pattern noise correction feature.

#### FpncEnable

Standard	Custom
Feature type	Boolean
Access	Read/Write
Visibility	Beginner
Possible values	<i>true, false</i>
Default	<i>true</i>
Category	/CorrectionControl/FpncControls

Control fixed pattern noise correction.

Value	Description
<i>true</i>	Fixed pattern noise correction is enabled.
<i>false</i>	Fixed pattern noise correction is disabled.

## DefectMaskControls

This feature sub-group includes the defect mask feature.

### DefectMaskEnable

Standard	Custom
<b>Feature type</b>	Boolean
<b>Access</b>	Read/Write
<b>Visibility</b>	Beginner
<b>Possible values</b>	true, false
<b>Default</b>	true
<b>Category</b>	/CorrectionControl/DefectMaskControls

Control defective pixel masking. Defective pixels values are replaced with averaged values from neighboring pixels. The defect pixel list is configured at the time of production.

Value	Description
<i>true</i>	Defect masking is enabled.
<i>false</i>	Defect masking is disabled.

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