



GigE VISION CAMERAS

GigE Features Reference

V5.0.0

Legal notice

Trademarks

Unless stated otherwise, all trademarks shown in this document of Allied Vision Technologies are brands protected by law. All other product or company names may be trademarks of their respective owners.

Warranty

The information provided by Allied Vision Technologies is supplied without any guarantees or warranty whatsoever, be it specific or implicit. Also excluded are all implicit warranties concerning the negotiability, the suitability for specific applications or the non-breaking of laws and patents. Even if we assume that the information supplied to us is accurate, errors and inaccuracy may still occur.

Copyright

All texts, pictures and graphics are protected by copyright and other laws protecting intellectual property. It is not permitted to copy or modify them for trade use or transfer, nor may they be used on websites.

For the latest version of this document, please visit our documentation website. Copyright © 2016 Allied Vision Technologies GmbH. All rights reserved.



Read this reference carefully

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

Contents

Legal notice	2
Trademarks	2
Warranty	2
Copyright	2
Contact us	7
Introduction	8
About this document	9
Document history	10
Reference conventions	13
Styles	13
Access	13
Symbols	13
Additional information	14
Allied Vision software	14
Third-party software	14
GigE camera and driver features	15
Acquisition	16
AcquisitionAbort	16
AcquisitionFrameCount	16
AcquisitionFrameRateAbs	16
AcquisitionFrameRateLimit	17
AcquisitionMode	17
AcquisitionStart	18
AcquisitionStop	18
RecorderPreEventCount	19
SensorShutterMode	19
Trigger	21
BufferHandlingControl	25
StreamAnnounceBufferMinimum	25
StreamAnnouncedBufferCount	25
StreamBufferHandlingMode	25
Controls	26
BlackLevelControl	26
CCDTemperatureOK	26
ColorTransformationControl	27
DSPSubregion	29

EdgeFilter	30
DefectMaskEnable	31
DefectMask	31
EFLensControl	32
Exposure	38
FpncEnable	47
GainControl/Gain	47
Gamma	51
Hue	52
IODMode	52
Iris	53
LensDrive	57
LUTControl	59
NirMode	62
Saturation	64
SubstrateVoltage	64
Whitebalance	64
DeviceStatus	68
DeviceTemperature	68
DeviceTemperatureSelector	68
EventControl	69
EventData	69
EventID	70
EventNotification	75
EventSelector	76
EventsEnable1	76
GigE	77
BandwidthControlMode	77
ChunkModeActive	77
Configuration	79
Current	79
GVCP	80
GevSCPSPacketSize	83
NonImagePayloadSize	83
PTP	84
PayloadSize	86
Persistent	86
StreamBytesPerSecond	87
StreamFrameRateConstrain	88
StreamHold	88
Timestamp	89
IO	91
StatusLED	91
Strobe	93

SyncIn.....	95
SyncOut.....	96
ImageFormat.....	99
Height.....	99
HeightMax.....	99
ImageSize.....	99
OffsetX.....	100
OffsetY.....	100
PixelFormat.....	101
Width.....	103
WidthMax.....	103
ImageMode.....	104
BinningHorizontal.....	104
BinningHorizontalMode.....	104
BinningVertical.....	105
BinningVerticalMode.....	105
DecimationHorizontal.....	106
DecimationVertical.....	107
ReverseX.....	108
ReverseY.....	108
SensorHeight.....	108
SensorTaps.....	109
SensorWidth.....	109
Info.....	110
GevDeviceMACAddress.....	110
DeviceFirmwareVersion.....	110
DeviceID.....	110
DeviceModelName.....	110
DevicePartNumber.....	111
DeviceScanType.....	111
DeviceUserID.....	111
DeviceVendorName.....	111
FirmwareVerBuild.....	112
FirmwareVerMajor.....	112
FirmwareVerMinor.....	112
SensorBits.....	112
SensorType.....	113
SavedUserSets.....	114
UserSetDefaultSelector.....	114
UserSetLoad.....	114
UserSetSave.....	114
UserSetSelector.....	115
Stream.....	116

Info	116
Multicast	116
Settings	117
Statistics	121
StreamInformation	126
StreamID	126
StreamType	126
Index	127

Contact us

Connect with Allied Vision by function

<https://www.alliedvision.com/en/meta-header/contact.html>

Find an Allied Vision office or Allied Vision distributor

<https://www.alliedvision.com/en/about-us/where-we-are.html>

Email

info@alliedvision.com

support@alliedvision.com

Sales offices

Europe, Middle East, and Africa: +49 36428-677-230

North and South America: +1 (877) USA-1394

Asia-Pacific: +65 6634-9027

China: +86 (21) 64861133

Headquarters

Allied Vision Technologies GmbH
Taschenweg 2a, 07646 Stadtroda
Germany

Tel: +49 36428-677-0

Fax: +49 36428-677-28

President/CEO: Frank Grube

Registration Office: AG Jena HRB 208962

Tax ID: DE 184383113

Introduction



This chapter includes:

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

About this document

This document describes the standard and advanced camera controls for Allied Vision GigE cameras as seen from the Vimba Viewer.

This document applies to the GigE Vision camera families listed below and describes their features.

Bigeye G	Prosilica GB	Prosilica GS
Mako G	Prosilica GC	Prosilica GT
Manta	Prosilica GE	Prosilica GX



Further information available online

For more information about Allied Vision Cameras, see:

<https://www.alliedvision.com/en/products/cameras>



Some features are not available for all camera models.

Example:

- White balance is not available for monochrome cameras.

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

Examples:

- Color correction features are implemented in Manta, Mako G, and Prosilica GT color cameras, but not the GB, GE, GC, GX cameras.
- Color correction is supported in Manta, Mako G, and Prosilica GT. It is not available in color cameras if they are operated with Bayer pixel formats, but works if debayering is done within the camera.



GigE IR & scientific camera and driver features chapter was removed. This content has been moved to a new standalone document for all Goldeye G, Goldeye G Cool, and Goldeye CL cameras.

Document history

Version	Date	Remarks
V1.0.0	2013-Jul-04	New Reference- Release status
V1.0.1	2013-Sep-06	<p>Added the EF lens controls</p> <p>Added <code>ReverseX</code> control on page 108</p> <p>Updated <code>DefectMaskPixelEnable</code> feature</p> <p>Updated controls in the <code>Statistics</code> feature</p> <p>Updated controls in the <code>DeviceStatus</code> feature</p>
V2.0.0	2014-Jul-22	<p>Added GigE IR & scientific camera and driver features chapter</p> <p>Created GigE camera and driver features chapter by merging camera controls and driver controls chapters of V1.0.1 of this document</p> <p>Added <code>BufferHandlingControl</code> and <code>StreamInformation</code> categories, applicable for Vimba V1.3 or higher</p> <p>Replaced <code>GVCPHBInterval</code> with <code>GevHeartbeatTimeout</code> and <code>GevHeartbeatInterval</code>, applicable for Vimba V1.3 or higher</p> <p>Update the following in GigE camera and driver features chapter</p> <ul style="list-style-type: none"> Updated <code>PixelFormat</code>, <code>Hue</code>, <code>Saturation</code>, and <code>ColorTransformationControl</code> For Vimba Viewer V1.1.1 or higher, <code>GevDeviceMACAddress</code> is moved under <code>Info</code> Updated <code>ChunkModeActive</code>, and <code>AcquisitionFrameRateAbs</code> Added note on binning in <code>BinningHorizontal</code> and <code>BinningVertical</code> Removed the EF lens controls from the document until the camera samples are available Removed <code>FrameTrigger</code> from <code>SyncOutSource</code> on page 97
V2.0.1	2014-Aug-15	<p>Removed the unavailable pixel formats from the list for GigE IR & scientific cameras</p> <p>Removed EF lens information from the <code>ChunkModeActive</code> control</p>
V2.0.2	2014-Oct-08	<p>Added background color to GigE IR & scientific camera and driver features chapter to distinguish it from GigE camera and driver features chapter.</p> <p>Following changes are made in the GigE camera and driver features chapter:</p> <ul style="list-style-type: none"> Updated <code>ChunkModeActive</code>, <code>BinningHorizontal</code>, <code>BinningVertical</code>, <code>DecimationHorizontal</code>, <code>DecimationVertical</code>, <code>PTP</code>, and <code>LUTControl</code> Moved <code>ReverseX</code> under <code>ImageMode</code> category Added <code>ReverseY</code> Removed <code>GainRaw</code> Updated <code>ExposureTimeAbs</code>, <code>GainAuto</code>, and <code>Gain</code> Added <code>ExposureTimeIncrement</code> Removed the <code>other</code> option from <code>ExposureAuto</code> Added <code>TriggerWidth</code> option for <code>ExposureMode</code>

Table 1: Document history

Version	Date	Remarks
V3.0.0	2015-Jan-15	<p>Updated Allied Vision logo</p> <p>Updated Statistics category in both <i>GigE camera and driver features</i> and GigE IR & scientific camera and driver features chapters</p> <p>Renamed:</p> <ul style="list-style-type: none"> Chapter 'AVT GigE camera and driver features' to <i>GigE camera and driver features</i> Chapter 'AVT GigE IR & scientific camera and driver features' to GigE IR & scientific camera and driver features <p>Following changes are made in the <i>GigE camera and driver features</i> chapter:</p> <ul style="list-style-type: none"> Added SensorShutterMode, BinningVerticalMode, BinningHorizontalMode, and DefectMaskEnable Updated BinningHorizontal and BinningVertical Added <i>PieceWiseLinearHDR</i> option in ExposureMode Added ExposureTimePWL1, ExposureTimePWL1, ThresholdPWL1, and ThresholdPWL1 Updated ExposureTimeAbs, ExposureAuto, AcquisitionFrameRateAbs, GainAuto, IrisMode, and BalanceWhiteAuto <p>Following changes are made in the GigE IR & scientific camera and driver features chapter:</p> <ul style="list-style-type: none"> Moved BandwidthControlMode under DeviceControl category Added DeviceFamilyName, DeviceFanMode, DeviceFanRpm, DeviceLinkHeartbeatTimeout, and DeviceFanSelector under DeviceControl category Updated ExposureAuto, NUCDatasetDescription, SensorTemperatureControlState, SensorTemperatureSetpointValue, and GevHeartbeatTimeout Removed Line3 and Line4 references from EventData, EventSelector, TriggerSource, LineInSelector, LineOutSelector, LineOutSource, StrobeSource, and EventID as these are not implemented in camera firmware Added GigEVision category Added SensorOffsetX and SensorOffsetY under ImageFormatControl category Moved StreamInformation before TransportLayerControl Removed GVCPHBInterval as it is replaced by GevHeartbeatInterval in Vimba V1.3 Removed GevHeartbeatTimeout because it is replaced by DeviceLinkHeartbeatTimeout in camera firmware V2.04.03
V3.1.0	2015-Mar-10	<p>Added EFLensControl</p> <p>Updated DefectMaskEnable, PtpMode, and PtpStatus</p> <p>Updated ChunkModeActive and SensorShutterMode</p>

Table 1: Document history (Continued)

Version	Date	Remarks
V3.2.0	2015-Mar-20	<p>Replaced old links with new Allied Vision website links</p> <p>Changed this documents name from 'GigE Camera and Driver Features' to 'GigE Features Reference'</p> <p>Following changes are made in the GigE IR & scientific camera and driver features chapter:</p> <ul style="list-style-type: none"> • Added BackgroundCorrection category • Added IntegrationMode control • Updated NUCDatasetGain, NUCDatasetActiveGain, and SensorTemperatureSetpointSelector • Updated SensorTemperatureSetpointActive, NonImagePayloadSize, and SensorGain
V4.0.0	2015-Aug-25	<p>Updated the document according to Allied Vision's new layout and brand guidelines</p> <p>Added <code>GevIPConfigurationApply</code> feature in GigE camera and driver features chapter</p> <p>Following changes are made in the GigE IR & scientific camera and driver features chapter:</p> <ul style="list-style-type: none"> • Added BinningHorizontal, BinningHorizontalMode, BinningVertical, and BinningVerticalMode under ImageFormatControl category • Added LUTControl category • Added <code>GevIPConfigurationApply</code> feature
V5.0.0	2016-Feb-17	<p>Removed the GigE IR & scientific camera and driver features chapter. This content has been moved to a new standalone document for all Goldeye G, Goldeye G Cool, and Goldeye CL cameras.</p> <p>Added <code>EventExposureStart</code> event. When enabled, will send an event from the camera when the exposure start event occurs. Event ID: 40019</p> <p>Added affected features to tables</p> <p>Defined <code>EventIDs</code></p> <p>Added <code>SensorTaps</code> feature</p> <p>Added <code>Fpnc</code> feature</p>

Table 1: Document history (Continued)

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	Function	Example
Emphasis	Program names, UI elements, highlighting important information	control
Courier New	Feature names	Input
Courier New Italics	Feature values	<i>Mode</i>
Blue	Cross references, web page links, email links	Link

Access

Abbreviation	Meaning
R/W	Feature is read/write
R/(W)	Feature is read only. It may be read/write depending upon the user privilege level
R/C	Feature is read only and constant
R	Feature is read only and may change

Symbols



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. The URL itself is shown in blue. Example:

<https://www.alliedvision.com>

Additional information

Allied Vision software

Allied Vision provides a number of software packages, all of which are free of charge and contain the following components:

- Drivers
- Software Development Kit (SDK) for camera control and image acquisition
- Examples based on the provided APIs of the SDK
- Documentation and release notes
- Viewer application to operate/configure the cameras



All software packages (including documentation and release notes) provided by Allied Vision can be downloaded at:

<https://www.alliedvision.com/en/support/software-downloads>

Third-party software

In general, third-party software provides increased functionality such as image processing and video recording. Vimba SDK is based on the GenICam standard. GenICam-based third-party software automatically connect with Vimba's transport layers. Additionally, Vimba includes the Cognex Adapter for VisionPro.



Allied Vision cameras can be easily used with third party image-processing libraries. Allied Vision partners with all major software providers to ensure full compatibility of our SDK and easy integration of our cameras into your system. For more information see:

<https://www.alliedvision.com/en/products/software/third-party-libraries.html>

Please note: Allied Vision does not endorse one product or vendor rather than the other nor provide technical support for third-party solutions. Please contact the respective software vendor for assistance.

GigE camera and driver features



This chapter lists standard and advanced camera and driver controls, as seen from the Vimba Viewer.

Acquisition

This category of controls relates to image acquisition.

AcquisitionAbort

Origin of feature	Camera
Type	Command
Affected features	AcquisitionStart, AcquisitionStop

Software command to stop the camera from receiving frame triggers and abort the current acquisition. A partially transferred image will be completed.

AcquisitionFrameCount

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 65535
Default	1
Unit	Frames
Affected features	N/A

Defines the number of frames to capture in a limited sequence of images. Used with *AcquisitionMode = MultiFrame* or *Recorder*. In *Recorder* mode, *AcquisitionFrameCount* cannot exceed *StreamHoldCapacity*.

AcquisitionFrameRateAbs

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Unit	Frames per second
Affected features	ExposureTimeAbs, AcquisitionFrameRateLimit

When *TriggerSelector = FrameStart* and either *TriggerMode = Off* or *TriggerSource = FixedRate*, this control specifies the frame rate. Depending on the exposure duration, the camera may not achieve the frame rate set here.



- If `ExposureMode = Timed`
Ensure $[1/\text{ExposureTimeAbs}] > \text{AcquisitionFrameRateAbs}$ to achieve target frame rate.
 - If `ExposureMode = TriggerWidth`
Ensure $[1/(\text{external trigger pulse width})] > \text{AcquisitionFrameRateAbs}$ to achieve target frame rate.
 - If `ExposureMode = PieceWiseLinearHDR`
Ensure the $[1/\text{ExposureTimeAbs}] > \text{AcquisitionFrameRateAbs}$ to achieve target frame rate.
- * `ExposureTimeAbs` in seconds

AcquisitionFrameRateLimit

Origin of feature	Camera
Type	Float
Access	R
Range	Camera dependent
Unit	Frames per second
Affected features	N/A

The maximum frame rate possible for the current exposure duration pixel format.

AcquisitionMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Continuous, SingleFrame, MultiFrame, Recorder</i>
Default	<i>Continuous</i>
Affected features	N/A

Determines the behavior of the camera when acquisition start is triggered.

Value	Description
<i>Continuous</i>	After an acquisition start event, the camera will continuously receive frame trigger events. See <code>TriggerSelector</code> and <code>TriggerSource</code> for more information.
<i>SingleFrame</i>	The camera will only deliver a single frame trigger event. Further trigger events will be ignored until acquisition is stopped and restarted.

Value	Description
<i>MultiFrame</i>	The camera will acquire the number of images specified by <i>AcquisitionFrameCount</i> . Further trigger events will be ignored until acquisition is stopped and restarted.
<i>Recorder</i>	<p>The camera will continuously record images into the camera on-board FIFO image buffer, but will not send them to the host until an <i>AcquisitionRecord</i> trigger signal is received. Further <i>AcquisitionRecord</i> trigger events will be ignored until acquisition is stopped and restarted.</p> <p>Combined with the <i>RecorderPreEventCount</i> control, this feature is useful for returning any number of frames before a trigger event.</p> <p>When <i>AcquisitionRecord</i> trigger is received, the currently imaging/acquiring image will complete as normal, and then at least one more image will be taken. The FIFO volatile image memory is a circular buffer, that starts rewriting images once it is full. Its size is determined by <i>AcquisitionFrameCount</i>.</p>

AcquisitionStart

Origin of feature	Camera
Type	Command
Affected features	<i>AcquisitionStop</i> , <i>AcquisitionAbort</i>

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

AcquisitionStop

Origin of feature	Camera
Type	Command
Affected features	<i>AcquisitionStart</i> , <i>AcquisitionAbort</i>

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

RecorderPreEventCount

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 65535
Default	0
Unit	Frames
Affected features	N/A

Valid when *AcquisitionMode* = *Recorder*. The number of frames returned before the *AcquisitionRecord* trigger event, with *AcquisitionFrameCount* minus *RecorderPreEventCount* frames being returned after the *AcquisitionRecord* trigger event.



At least one image must be captured after the *AcquisitionRecord* trigger event, i.e., you cannot set *RecorderPreEventCount* = 1, and *AcquisitionFrameCount* = 1.

SensorShutterMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Global</i> , <i>Rolling</i> , <i>GlobalReset</i>
Default	<i>Global</i>
Affected features	<i>ExposureTimeAbs</i> , <i>AcquisitionFrameRateLimit</i> , <i>AcquisitionFrameRateAbs</i> , <i>ExposureAutoMin</i> , <i>ExposureAutoMax</i>

Type of the shutter. The following figure illustrates the different sensor shutter modes.

Value	Description
<i>Global</i>	All pixels reset and start exposure at same time. All pixels are shifted to readout at same time. All pixels have the same <i>ExposureTimeAbs</i> .

Value	Description
<i>Rolling</i>	Each row is reset, exposed, and read out in succession from top to bottom of image. All pixels have the same <code>ExposureTimeAbs</code> . This mode is susceptible to motion blur; however, this mode offers enhanced SNR/dynamic range.
<i>GlobalReset</i>	All pixels reset and start exposure at same time. Pixels are shifted to readout one line at a time from top to bottom of image. This mode does not allow overlapped exposure and readout. In this mode, <code>ExposureTimeAbs</code> is the time from global reset to start of readout of top row. Subsequent rows will have a longer exposure time $\text{ExposureTimeAbs} + (\text{row readout time} \times \text{row number})$. This mode offers enhanced SNR/dynamic range with no motion blur, which is useful for strobe applications.

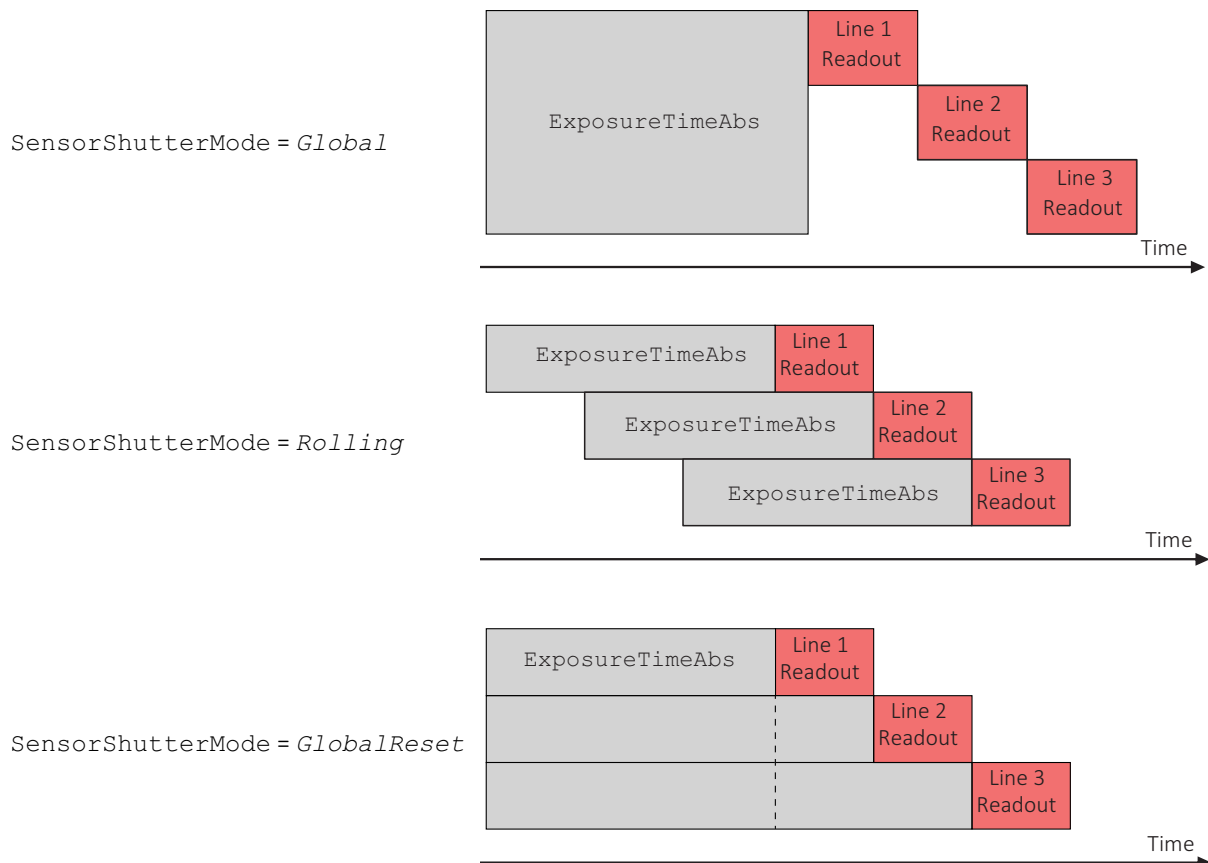


Figure 1: Illustration showing different sensor shutter modes

Trigger

This category relates to how an image frame is initiated or triggered.

TriggerActivation

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>RisingEdge, FallingEdge, AnyEdge, LevelHigh, LevelLow</i>
Default	<i>RisingEdge</i>
Affected features	N/A

Type of activation, for hardware triggers. This feature controls edge/level and polarity sensitivities.

Value	Description
<i>RisingEdge</i>	Rising edge trigger
<i>FallingEdge</i>	Falling edge trigger
<i>AnyEdge</i>	Rising or falling edge
<i>LevelHigh</i>	Active high signal
<i>LevelLow</i>	Active low signal

TriggerDelayAbs

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Default	<i>0</i>
Unit	μ s
Affected features	N/A

Start-of-image can be delayed to begin some time after a trigger event is received by the camera. This feature is valid only when `TriggerSource` is set to external trigger (i.e. *Line1, Line2*). This control is a common trigger to synchronize with a strobe lighting source, which will inherently have some fixed setup time.

TriggerMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, On</i>
Default	<i>On</i>
Affected features	N/A

Enables or disables trigger set in TriggerSelector.

Value	Description
<i>Off</i>	Trigger disabled
<i>On</i>	Trigger enabled



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

TriggerOverlap

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, PreviousFrame</i>
Default	<i>Off</i>
Affected features	N/A

Permitted window of trigger activation, relative to previous frame. Does not work with software triggering. Only external triggering.

Value	Description
<i>Off</i>	Any external trigger received before a high <i>FrameTriggerReady</i> signal is ignored
<i>PreviousFrame</i>	Any external trigger received before <i>FrameTriggerReady</i> is latched and used to trigger the next frame

TriggerSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>FrameStart, AcquisitionStart, AcquisitionEnd, AcquisitionRecord</i>
Default	<i>FrameStart</i>
Affected features	TriggerMode, TriggerSoftware, TriggerSource, TriggerActivation, TriggerOverlap, TriggerDelayAbs

Select a trigger, then use the controls {TriggerMode, TriggerSoftware, TriggerSource, TriggerActivation, TriggerOverlap, TriggerDelayAbs} to setup and read the trigger features.

Value	Description
<i>FrameStart</i>	The trigger which starts each image (when acquisition is running).
<i>AcquisitionStart</i>	The trigger which starts the acquisition process.
<i>AcquisitionEnd</i>	The trigger which ends the acquisition process.
<i>AcquisitionRecord</i>	The trigger which initiates the sending of AcquisitionFrameCount number of recorded images from the camera on-board memory to the host.

TriggerSoftware

Origin of feature	Camera
Type	Command
Affected features	N/A

Triggers an image. Valid when TriggerSource = *Software*.

TriggerSource

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Freerun, Line1, Line2, Line3, Line4, FixedRate, Software</i> The number of external trigger lines is camera dependent.
Default	<i>Freerun</i>
Affected features	N/A



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/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 region of interest (ROI) size.
<i>Line1</i>	External trigger <i>Line1</i>
<i>Line2</i>	External trigger <i>Line2</i>
<i>Line3</i>	External trigger <i>Line3</i>
<i>Line4</i>	External trigger <i>Line4</i>
<i>FixedRate</i>	Camera self-triggers at a fixed frame rate defined by <i>AcquisitionFrameRateAbs</i> .
<i>Software</i>	Software initiated image capture.

BufferHandlingControl

StreamAnnounceBufferMinimum

Display name	Stream Announce Buffer Minimum
Origin of feature	Driver
Type	Integer
Access	R/C
Vimba version	Vimba V1.3 or later
Affected features	N/A

Minimal number of buffers to announce to enable selected acquisition mode.

StreamAnnouncedBufferCount

Display name	Stream Announced Buffer Count
Origin of feature	Driver
Type	Integer
Access	R
Vimba version	Vimba V1.3 or later
Affected features	N/A

Number of announced (known) buffers on this stream.

StreamBufferHandlingMode

Display name	Stream Buffer Handling Mode
Origin of feature	Driver
Type	Enumeration
Access	R/W
Default	Default
Vimba version	Vimba V1.3 or later
Affected feature	StreamAcquisitionModeSelector

Available buffer handling modes of this stream.

Controls

BlackLevelControl

BlackLevel

Origin of feature	Camera
Type	Float
Access	R/W
Range	0 to 255.75
Default	0
Affected features	N/A

Black level value. Setting the Gain does not change the BlackLevel.

BlackLevelSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Default	ALL
Affected features	N/A

If set to *ALL*, BlackLevel will be applied to all channels or taps.

CCDTemperatureOK

Origin of feature	Camera
Type	Integer
Access	R
Default	0
Affected features	N/A

Current temperature status of the CCD sensor. Indicates if CCD sensor has desired cooling temperature.

Value	Description
0	The CCD sensor may be too hot. Acquired image data may have higher noise than expected or contain erroneous pixels at long exposure times.
1	The CCD sensor temperature is in the desired temperature range. Acquired image data are OK.

ColorTransformationControl

This section describes features related to color transformations in Allied Vision GigE color cameras. The following controls are only valid when using on-camera interpolated pixel formats.



The color transformation is a linear operation taking as input the triplet R_{in} , G_{in} , B_{in} for an RGB color pixel. This triplet is multiplied by a 3x3 matrix. This color transformation allows to change the coefficients of the 3x3 matrix.

$$\begin{bmatrix} R_{out} \\ G_{out} \\ B_{out} \end{bmatrix} = \begin{bmatrix} Gain00 & Gain01 & Gain02 \\ Gain10 & Gain11 & Gain12 \\ Gain20 & Gain21 & Gain22 \end{bmatrix} \times \begin{bmatrix} R_{in} \\ G_{in} \\ B_{in} \end{bmatrix}$$

ColorTransformationMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off</i> , <i>Manual</i> , <i>Temp6500K</i>
Default	<i>Off</i>
Affected feature	ColorTransformationValue

Selects the mode for the color transformation.

Value	Description
<i>Off</i>	No color transformation.
<i>Manual</i>	Manually set ColorTransformationValue matrix coefficients.
<i>Temp6500K</i>	Colors optimized for a surrounding color temperature 6500 K.

ColorTransformationSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible value	<i>RGBtoRGB</i>
Affected feature	ColorTransformationValue

Selects which color transformation module is controlled by the various color transformation features.

ColorTransformationValue

Origin of feature	Camera
Type	Float
Access	R/W
Range	-2 to 2
Default	1
Affected features	N/A

Represents the value of the selected gain factor or offset inside the transformation matrix.

ColorTransformationValueSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Gain00, Gain01, Gain02, Gain10, Gain11, Gain12, Gain20, Gain21, Gain22</i>
Default	<i>Gain00</i>
Affected feature	ColorTransformationValue

Selects the gain factor or offset of the transformation matrix if `ColorTransformationMode = Manual`.

Value	Description
<i>Gain00</i>	Red contribution to the red pixel (multiplicative factor).
<i>Gain01</i>	Green contribution to the red pixel (multiplicative factor).
<i>Gain02</i>	Blue contribution to the red pixel (multiplicative factor).
<i>Gain10</i>	Red contribution to the green pixel (multiplicative factor).
<i>Gain11</i>	Green contribution to the green pixel (multiplicative factor).
<i>Gain12</i>	Blue contribution to the green pixel (multiplicative factor).
<i>Gain20</i>	Red contribution to the blue pixel (multiplicative factor).
<i>Gain21</i>	Green contribution to the blue pixel (multiplicative factor).
<i>Gain22</i>	Blue contribution to the blue pixel (multiplicative factor).

DSPSubregion

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

DSPSubregionBottom

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to sensor height
Default	<i>Sensor height</i>
Affected features	N/A

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.

DSPSubregionLeft

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to sensor width
Default	<i>0</i>
Affected features	N/A

Defines the left edge of the DSP subregion.

DSPSubregionRight

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to sensor width
Default	<i>Sensor width</i>
Affected features	N/A

Defines the right edge of the DSP subregion.

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



DSPSubregionTop

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to sensor height
Default	0
Affected features	N/A

Defines the top edge of the DSP subregion.

EdgeFilter

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Smooth2, Smooth1, Off, Sharpen1, Sharpen2</i>
Default	<i>Off</i>
Affected features	N/A

Image sharpness/blur. Applied post Bayer interpolation. Only available on color pixel formats noted with on-camera interpolation.

Value	Description
<i>Smooth2</i>	Most blur
<i>Smooth1</i>	Slight blur
<i>Off</i>	No blur or sharpness applied
<i>Sharpen1</i>	Slight sharp
<i>Sharpen2</i>	Most sharp



EdgeFilter feature is applicable only to color models and Manta cameras except dual-tap camera models.

DefectMaskEnable

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	<i>true, false</i>
Default	<i>true</i>
Affected features	N/A

Enables or disables masking of defective pixel. Defective pixels are replaced with averaged values from neighboring pixels.

Value	Description
<i>true</i>	Enables defect masking
<i>false</i>	Disables defect masking



If `BinningHorizontal`, `BinningVertical`, `DecimationHorizontal`, or `DecimationVertical` is set greater than 1, `DefectMaskEnable` is set to *False*.



For more information on the Defect Mask Loader and defect masking process, see the Defect Masking application note at:

<https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html>

DefectMask

Some larger format sensors may contain defective columns. Class 1 and Class 0 sensors are available with no defective columns.



See the Modular Concept document, or contact your Allied Vision sales team for more information.

<https://www.alliedvision.com/en/support/technical-documentation.html>

DefectMaskColumnEnable

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Enabled, Disabled</i>
Default	<i>Enabled</i>
Affected features	N/A

Defect masking replaces defective columns with interpolated values based on neighboring columns. Defective columns are detected and recorded at the factory.

Value	Description
<i>Enabled</i>	Enables masking of defective columns.
<i>Disabled</i>	Disables masking of defective columns.



For more information on the `Loaddefects` application and column defect masking process, see the Defect Masking application note at:

<https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html>

DefectMaskPixelEnable

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Enabled, Disabled</i>
Default	<i>Enabled</i>
Affected features	N/A

Enable masking of defective pixels.

EFLensControl

The section describes features related to EF lens control in Allied Vision GigE cameras with integrated EF-Mount.



The features listed under `EFLensControl` are not available for cameras with Birger EF-Mount option.

EFLensFStop

EFLensFStopCurrent

Origin of feature	Camera
Type	Float
Access	R/W
Range	<code>EFLensFStopMin</code> to <code>EFLensFStopMax</code>
Unit	μ s
Affected features	N/A

Current F-stop number or aperture of the EF lens.

EFLensFStopDecrease

Origin of feature	Camera
Type	Command
Affected feature	EFLensFStopCurrent

Decrease F-stop number, i. e., increase lens aperture by the EFLensFStopStepSize.

EFLensFStopIncrease

Origin of feature	Camera
Type	Command
Affected feature	EFLensFStopCurrent

Increase F-stop number, i. e., reduce lens aperture by the EFLensFStopStepSize.

EFLensFStopMax

Origin of feature	Camera
Type	Float
Access	R
Default	<i>Lens dependent</i>
Unit	F-Stop
Affected feature	EFLensFStopCurrent

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

EFLensFStopMin

Origin of feature	Camera
Type	Float
Access	R
Default	<i>Lens dependent</i>
Unit	F-Stop
Affected feature	EFLensFStopCurrent

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

EFLensFStopStepSize

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 8
Unit	F-Stop/8
Affected features	N/A

Size of increments/decrements in EFLensFStopCurrent when using EFLensFStopIncrease and EFLensFStopDecrease commands, respectively.

EFLensFocus

EFLensFocusCurrent

Origin of feature	Camera
Type	Integer
Access	R/W
Range	EFLensFocusMin to EFLensFocusMax
Affected features	N/A

Current focus setting.

EFLensFocusDecrease

Origin of feature	Camera
Type	Command
Affected feature	EFLensFocusCurrent

Decrease/shorten focus distance by EFLensFocusStepSize.

EFLensFocusIncrease

Origin of feature	Camera
Type	Command
Affected feature	EFLensFocusCurrent

Increase/lengthen focus distance by EFLensFocusStepSize.

EFLensFocusMax

Origin of feature	Camera
Type	Integer
Access	R
Default	<i>Lens dependent</i>
Affected feature	EFLensFocusCurrent

Maximum/farthest possible focus setting.

EFLensFocusMin

Origin of feature	Camera
Type	Integer
Access	R
Default	<i>Lens dependent</i>
Affected feature	EFLensFocusCurrent

Minimum/nearest possible focus setting.

EFLensFocusStepSize

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Lens dependent
Default	10
Affected features	N/A

Size of increments/decrements in EFLensFocusCurrent when using EFLensFocusIncrease and EFLensFocusDecrease commands, respectively.

EFLensFocusSwitch

Origin of feature	Camera
Type	Enumeration
Access	R
Possible values	<i>AutoFocus</i> , <i>ManualFocus</i>
Affected features	N/A

Current position of lens AF/MF switch.

Value	Description
<i>AutoFocus</i>	Switch is in auto focus (AF) position
<i>ManualFocus</i>	Switch is in manual focus (MF) position



All controls under `EFLensFocus` become read-only when the lens AF/MF switch is set to manual focus (MF).

EFLensInitialize

Origin of feature	Camera
Type	Command
Affected features	<code>EFLensFStopCurrent</code> , <code>EFLensFStopMax</code> , <code>EFLensFStopMin</code> , <code>EFLensFocusSwitch</code> , <code>EFLensFocusCurrent</code> , <code>EFLensID</code> , <code>EFLensLastError</code> , <code>EFLensState</code> , <code>EFLensZoomCurrent</code> , <code>EFLensZoomMax</code> , <code>EFLensZoomMin</code>

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

EFLensStatus

EFLensID

Origin of feature	Camera
Type	Integer
Access	R
Affected features	N/A

Identification value of the attached EF lens.

EFLensLastError

Origin of feature	Camera
Type	Enumeration
Access	R
Possible values	<i>EFLensErrNone, EFLensErrQuery, EFLensErrInternal1, EFLensErrInternal2, EFLensErrBusy, EFLensErrZeroStop, EFLensErrInfinityStop</i>
Affected features	N/A

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).
<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

Origin of feature	Camera
Type	Enumeration
Access	R
Affected features	N/A

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 EFLensLastError. Remains in this state until EFLensInitialize is executed.

EFLensZoom

EFLensZoomCurrent

Origin of feature	Camera
Type	Integer
Access	R
Range	<i>EFLensZoomMin</i> to <i>EFLensZoomMax</i>
Units	mm
Affected features	N/A

Current focal length of the EF lens.

EFLensZoomMax

Origin of feature	Camera
Type	Integer
Access	R
Default	Lens dependent
Units	mm
Affected features	N/A

Maximum focal length of the EF lens.

EFLensZoomMin

Origin of feature	Camera
Type	Integer
Access	R
Default	Lens dependent
Units	mm
Affected features	N/A

Minimum focal length of the EF lens.

Exposure

ExposureAuto

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, Once, Continuous, other</i>

Default	<i>Off</i>
Affected features	N/A

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

Value	Description
<i>Off</i>	The automatic mode is <i>Off</i> .
<i>Once</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . Auto-exposure occurs until target is achieved, then <code>ExposureAuto</code> returns to <i>Off</i> .
<i>Continuous</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . The exposure time will vary continuously according to the scene illumination. The auto exposure function operates according to the <code>ExposureAuto</code> and <code>DSPSubregion</code> 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. Adding simultaneous `IrisMode = Video/DCIris/PIrisAuto` results in undefined, "race to target" behavior.

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

ExposureAutoAdjustTol

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 50
Default	5
Unit	Percent
Affected features	N/A

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

ExposureAutoAlg

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Mean, FitRange</i>
Default	<i>Mean</i>
Affected features	N/A

The following algorithms can be used to calculate auto exposure.

Value	Description
<i>Mean</i>	The arithmetic mean of the histogram of the current image is compared to <code>ExposureAutoTarget</code> , and the next image adjusted in exposure time to meet this target. Bright areas are allowed to saturate.
<i>FitRange</i>	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.

ExposureAutoMax

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	<i>500000</i>
Unit	μs
Affected features	N/A

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 $(\text{as a rough estimate}) 1 \times 10^6 / (\text{desired frame rate})$.

ExposureAutoMin

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	<i>Camera dependent</i>
Unit	μs
Affected features	N/A

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

ExposureAutoOutliers

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 1000
Default	0
Unit	0.01% i.e. 1000 = 10%
Affected features	N/A

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.

ExposureAutoRate

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 100 1 (slowest) to 100 (fastest)
Default	100
Unit	Percent
Affected features	N/A

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.

ExposureAutoTarget

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 100 0 being black, 100 being white
Default	50
Unit	Percent
Affected features	N/A

The general lightness or darkness of the auto exposure feature; specifically the target mean histogram level of the image.



Higher values result in brighter images.

ExposureMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Timed, TriggerWidth, PieceWiseLinearHDR, InterleavedHDR, BracketHDR</i>
Default	<i>Timed</i>
Affected features	N/A

Control for exposure duration.

Value	Description
<i>Timed</i>	Camera exposure time is set by <i>ExposureTimeAbs</i>
<i>TriggerWidth</i>	Camera exposure time is controlled by external trigger pulse on <i>Line1</i> or <i>Line2</i> . In order for this feature to work, <i>TriggerSelector</i> = <i>FrameStart</i> and <i>TriggerSource</i> must be set to <i>Line1</i> or <i>Line2</i> .

Value	Description
<i>PieceWiseLinearHDR</i>	Image dynamic range is increased in difficult lighting situations by clamping down bright pixels with light levels beyond <i>ThresholdPWL</i> limits. Overall camera exposure time is set by <i>ExposureTimeAbs</i> . HDR sub-exposures are set using <i>ExposureTimePWL1</i> and <i>ExposureTimePWL2</i> .
<i>InterleavedHDR</i>	<i>ExposureTimeAbs</i> for odd rows and <i>ExposureTimeInterleaved</i> for even rows.
<i>BracketHDR</i>	Exposures for three consecutive frames defined by <i>ExposureTimeAbs</i> , <i>ExposureTimeBracket1</i> , <i>ExposureTimeBracket2</i> respectively.

ExposureTimeAbs

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Unit	μs
Affected features	<i>AcquisitionFrameRateLimit</i> , <i>AcquisitionFrameRateAbs</i>

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

ExposureTimeAbs depends on *ExposureMode* as follows:

- *ExposureMode* = *Timed*
ExposureTimeAbs is sensor integration time.
- *ExposureMode* = *TriggerWidth*
ExposureTimeAbs is ignored.
- *ExposureMode* = *PieceWiseLinearHDR*
ExposureTimeAbs is the full sensor integration time. See *ExposureTimePWL1* and *ExposureTimePWL2* for setting *ThresholdPWL* exposure durations.

ExposureTimeIncrement

Origin of feature	Camera
Type	Float
Access	R/C
Range	Camera dependent

Unit	μs
Affected features	N/A

Increment/resolution of the exposure time in microseconds.

ExposureTimePWL1

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Unit	μs
Affected features	N/A

Valid only when `ExposureMode = PieceWiseLinearHDR`. Exposure time after `ThresholdPWL1` is reached.

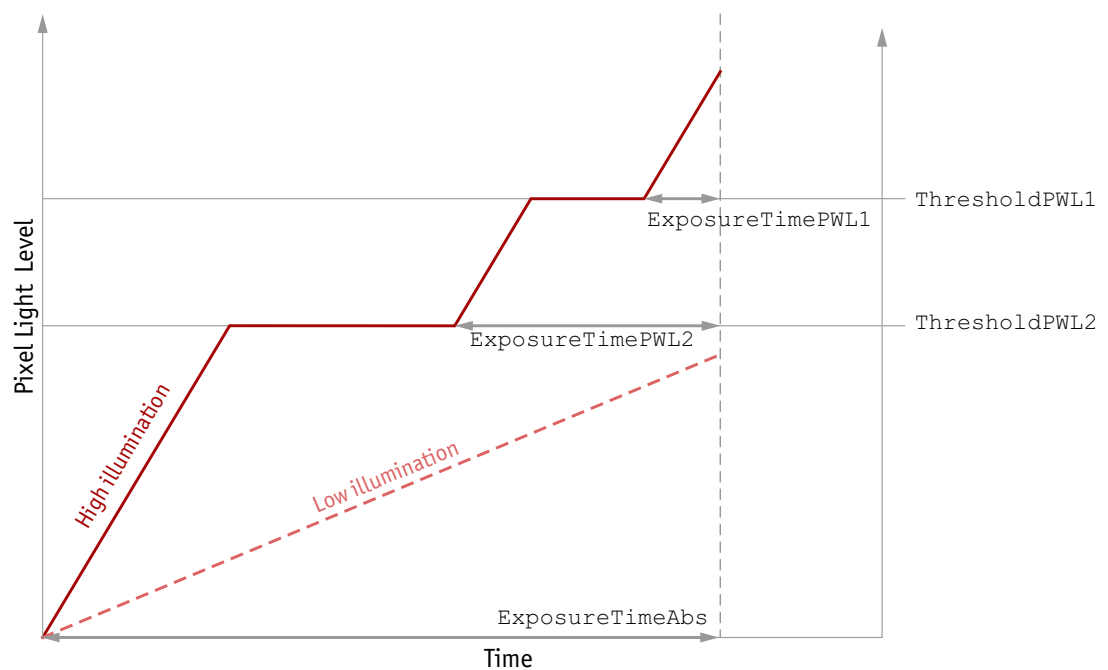


Figure 2: HDR sub exposures and thresholds when `ExposureMode = PieceWiseLinearHDR`

ExposureTimePWL2

Origin of feature	Camera
Type	Float
Access	R/W

Range	Camera dependent
Unit	µs
Affected features	N/A

Valid only when `ExposureMode = PieceWiseLinearHDR`. Exposure time after `ThresholdPWL2` is reached.



When `ThresholdPWL2` is less than `ThresholdPWL1` (i.e. enabled), `ExposureValuePWL2` must be greater than `ExposureValuePWL1`.

ThresholdPWL1

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 63 <i>0</i> = no light in pixel, <i>63</i> = full pixel light capacity
Default	<i>63</i>
Affected features	N/A

Valid only when `ExposureMode = PieceWiseLinearHDR`. The first and highest threshold level in `PieceWiseLinearHDR`.



Leaving `ThresholdPWL1` at *63* disables the first threshold of `PieceWiseLinearHDR` mode, effectively disabling HDR mode.

ThresholdPWL2

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 63 <i>0</i> = no light capacity, <i>63</i> = full pixel light capacity
Default	<i>63</i>
Affected features	N/A

Valid only when `ExposureMode = PieceWiseLinearHDR`. The second and lowest threshold level in `PieceWiseLinearHDR`.



Setting `ThresholdPWL2` above `ThresholdPWL1` disables the second threshold of `PieceWiseLinearHDR` mode.

Shutter

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, On, SyncIn1, SyncIn2, SyncIn3, SyncIn4, SyncIn5</i>
Default	<i>On</i>
Affected features	N/A

Activate or deactivate the mechanical shutter of Bigeye G-629B Cool cameras.

Value	Description
<i>Off</i>	Deactivate the mechanical shutter. Use this mode, if you operate the camera with pulsed light sources.
<i>On</i>	Activate the mechanical shutter. If activated, the mechanical shutter opens upon each exposure cycle and closes again, when the exposure is over. Use this mode, if you operate the camera with constant light sources, due to the full frame sensor.
<i>SyncIn1</i>	Enables or disables the mechanical shutter dependent on the level of <i>LineIn1</i> .
<i>SyncIn2</i>	Enables or disables the mechanical shutter dependent on the level of <i>LineIn2</i> .
<i>SyncIn3</i>	Enables or disables the mechanical shutter dependent on the level of <i>LineIn3</i> .
<i>SyncIn4</i>	Enables or disables the mechanical shutter dependent on the level of <i>LineIn4</i> .
<i>SyncIn5</i>	Enables or disables the mechanical shutter dependent on the level of <i>LineIn5</i> .



The shutter feature is intended to control the exposure by means of a mechanical shutter. It should not be confused with any other exposure control feature. The mechanical shutter is available only on the Bigeye G-629B Cool camera.

FpncEnable

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	<i>true, false</i>
Default	<i>true</i>
Affected features	N/A

Enabled Fixed Pattern Noise Correction.

GainControl/Gain

This feature controls the gain settings applied to the sensor.

Gain

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Default	<i>0</i>
Unit	1 dB
Affected features	N/A

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

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

GainAuto

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, Once, Continuous</i>
Default	<i>Off</i>
Affected features	N/A

Auto algorithms use information from the camera's current image and apply the following settings to the next image. Large 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 <i>Off</i> .
<i>Once</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . Auto-gain occurs until target is achieved, then <code>GainAuto</code> returns to <i>Off</i> .
<i>Continuous</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . The gain will vary continuously according to the scene illumination. The auto exposure function operates according to the <code>ExposureAutoControl</code> and <code>DSPSubregion</code> 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. Adding simultaneous `IrisMode = Video/DCIris/PIrisAuto` results in undefined, "race to target" behavior.

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

GainAutoAdjustTol

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 50
Default	5
Unit	Percent
Affected features	N/A

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



This prevents needless small adjustments from occurring each image.

GainAutoMax

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Unit	dB
Affected features	N/A

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

GainAutoMin

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Default	0
Unit	dB
Affected features	N/A

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

GainAutoOutliers

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 1000
Default	0
Unit	0.01%, i.e. 1000 = 10%
Affected features	N/A

The total pixels from top of the distribution 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.

GainAutoRate

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 100 1 (slowest) to 100 (fastest)
Default	100
Unit	Percent
Affected features	N/A

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.

GainAutoTarget

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 100
Default	50
Unit	Percent
Affected features	N/A

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

GainSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible value	All
Default	All
Affected features	Gain, GainAuto

Gain will be applied to all channels or taps.

Gamma

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Default	1.00
Unit	Output = (Input) ^{Gamma}
Affected features	N/A

Nonlinear brightness control. Applies gamma value to the raw sensor signal (via LUT).

Value	Description
1.00	Gamma OFF (no Gamma correction)
Values other than 1.00	Gamma ON



Manta type A

If Gamma is ON, LUT 1 is used to do the gamma transform. The original LUT values will be stored temporarily. If Gamma is ON, and you read out LUT1: you only get stored LUT values but not Gamma values. In general, Gamma values cannot be read out.

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



Manta type B, Mako G, and Prosilica GT cameras have a standalone gamma function which does not share resources with LUTs.

Hue

Origin of feature	Camera
Type	Float
Access	R/W
Range	Camera dependent
Default	0.00
Unit	Degrees
Affected features	N/A

Alters color of image without altering white balance. Takes float input, although rounds to integer. Only valid when using on-camera interpolated pixel formats.



Hue turns the color vectors in the U/V plane. It is 1 degree per step.

IODMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Continuous, IOD, LineIn1, LineIn2, LineIn3, LineIn4, LineIn5</i>
Default	<i>IOD</i>
Affected features	N/A

Set camera to continuous or Image on Demand (IOD) mode.

Value	Description
<i>Continuous</i>	The camera requires no external exposure signal. The camera generates a constant exposure time independently. The exposure time is equal to frame readout time and cannot be adjusted. Bigeye G-132B Cool, Bigeye G-283B Cool, and Bigeye G-1100B Cool achieve maximum frame rate in continuous mode only.
<i>IOD</i>	Enables IOD mode. In this mode the camera needs an external trigger signal or a timer driven internal exposure signal.
<i>LineIn1</i>	The camera is switched between <i>IOD</i> and <i>Continuous</i> mode, dependent on the level of <i>LineIn1</i> .

Value	Description
<i>LineIn2</i>	The camera is switched between <i>IOD</i> and <i>Continuous</i> mode, dependent on the level of <i>LineIn2</i> .
<i>LineIn3</i>	The camera is switched between <i>IOD</i> and <i>Continuous</i> mode, dependent on the level of <i>LineIn3</i> .
<i>LineIn4</i>	The camera is switched between <i>IOD</i> and <i>Continuous</i> mode, dependent on the level of <i>LineIn4</i> .
<i>LineIn5</i>	The camera is switched between <i>IOD</i> and <i>Continuous</i> mode, dependent on the level of <i>LineIn5</i> .



If *Continuous* mode is activated, no external exposure signal is allowed. Set *TriggerSelector* to *FrameStart* and *TriggerSource* to an unused external trigger Line.

Iris

Auto iris lens support. Supported auto iris lens types (camera dependent): video, DC, and P-Iris. GT series detects lens type on power up. DC settings will not apply if P-Iris lens connected. P-Iris settings will not apply if DC-Iris lens connected.

The auto iris algorithm calculates *IrisAutoTarget* based on information of the current image, and applies this to the next image. Large changes in scene lighting may require two to three frames for the algorithm to stabilize. Adding simultaneous *GainAuto* = *Continuous*, or *ExposureAuto* = *Continuous*, to *IrisMode* = *Video/DCIris/PIrisAuto* results in undefined, "race to target" behavior.



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

IrisAutoTarget

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 100 0 being black, 100 being white
Default	50
Unit	Percent
Affected features	N/A

Controls the general lightness or darkness of the auto iris feature; specifically the target mean histogram level of the image.

IrisMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Disabled, Video, VideoOpen, VideoClose, PIrisAuto, PIrisManual, DCIris</i>
Default	<i>Disabled</i>
Affected features	N/A

Sets the auto iris mode. Valid when ExposureMode = *Timed* or *PieceWiseLinearHDR*.

Value	Description
<i>Disabled</i>	Disable auto iris.
<i>Video</i>	Enable video iris. Video-type lenses only.
<i>VideoOpen</i>	Fully open a video iris. Video-type lenses only.
<i>VideoClose</i>	Full close a video iris. Video-type lenses only.
<i>PIrisAuto</i>	Enable precise auto iris. P-Iris lenses only.
<i>PIrisManual</i>	Manually control iris via LensPIrisPosition feature. P-Iris lenses only.
<i>DCIris</i>	Enable DC auto iris. DC-Iris lenses only.

IrisVideoLevel

Origin of feature	Camera
Type	Integer
Access	R
Range	0 to 150
Default	<i>0</i>
Unit	mV pp
Affected features	N/A

Current video iris level, which is the strength of the video signal coming from the camera. Dependent on lens type. When calibrating a video lens, this value should fall between *IrisVideoLevelMin* and *IrisVideoLevelMax*.

Lens type	Range	Description
Video-type lenses	0 to 150	Reference voltage. This value should fall between <i>IrisVideoLevelMin</i> and <i>IrisVideoLevelMax</i>

Lens type	Range	Description
P-Iris lenses	0 to 100	Attempts to match <code>IrisAutoTarget</code>
DC-Iris lenses	0 to 100	Attempts to match <code>IrisAutoTarget</code>

IrisVideoLevelMax

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 150
Default	Camera dependent
Unit	10 mV Manta: 13.2 mV
Affected features	N/A

Video-type lenses only. Limits the maximum driving voltage for closing the lens iris. Typically, this will be 150; however, it may vary depending on the lens reference voltage. A lower minimum value slows the adjustment time but prevents excessive overshoot.

IrisVideoLevelMin

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 150
Default	Camera dependent
Unit	10 mV Manta: 13.2 mV
Affected features	N/A

Video-type lenses only. Limits the minimum driving voltage for opening the lens iris. A higher minimum value slows the adjustment time but prevents excessive overshoot.

LensDCIris

DC-Iris lenses only.

LensDCDriveStrength

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 50
Default	10
Affected features	N/A

Lens drive voltage. Altering this value changes the speed at which a DC-Iris lens operates. The lower the value, the slower the lens operates. A higher value may result in iris oscillation. The optimal value is lens dependent. Larger lenses typically require a larger drive voltage.

LensPIris

P-Iris lenses only. P-Iris allows discrete iris positions using an internal lens stepping motor.



For a list of P-Iris supported lenses, see the P-Iris Lenses Supported by Prosilica GT Cameras application note:

<https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html>

LensPIrisFrequency

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 1000
Default	100
Unit	Hz
Affected features	N/A

Stepping motor drive rate. Lens dependent. Use the value defined in *Prosilica GT Technical Manual*, or contact the lens manufacturer.

LensPirisNumSteps

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 1023
Default	50
Affected features	N/A

Maximum number of discrete iris/aperture positions. Use the value defined in *Prosilica GT Technical Manual*, or contact the lens manufacturer.

LensPirisPosition

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 1022
Default	50
Affected features	N/A

Iris/aperture position. Manually control iris in *PIrisManual* mode, or read back iris position in *PIrisAuto* mode. 0 represents fully open and 1022 represents fully closed position. Values greater than `LensPirisNumSteps` are ignored/not written.

LensDrive

Open loop DC 3 axis lens control.

LensDriveCommand

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Stop, IrisTimedOpen, IrisTimedClose, FocusTimedNear, FocusTimedFar, ZoomTimedIn, ZoomTimedOut</i>
Affected features	N/A

Setting to any non-Stop value will execute the function for `LensDriveDuration` and then return to `Stop`.

Value	Description
<i>Stop</i>	No action
<i>IrisTimedOpen</i>	Open lens iris
<i>IrisTimedClose</i>	Close lens iris
<i>FocusTimedNear</i>	Shorten working distance
<i>FocusTimedFar</i>	Lengthen working distance
<i>ZoomTimedIn</i>	Zoom in
<i>ZoomTimedOut</i>	Zoom out

LensDriveDuration

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 5000
Default	0
Unit	ms
Affected features	N/A

Duration of timed lens commands.

LensVoltage

Origin of feature	Camera
Type	Integer
Access	R
Range	0 to 12000
Default	0
Unit	mV
Affected features	N/A

Reports the lens power supply voltage.

LensVoltageControl

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 12000

Default	0
Unit	mV * 100001
Affected feature	LensVoltage

Lens power supply voltage control. See lens documentation for appropriate voltage level. Set desired lens voltage in mV*100001. This is done to prevent users inadvertently setting an inappropriate voltage, possibly damaging the lens. If a bad value is written this control resets to 0.

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.



Color cameras only:

LUTControl with single color panes will not work if binning is enabled, due to loss of color information.

LUTEnable

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	<i>true, false</i>
Default	<i>false</i>
Affected features	N/A

Activates or deactivates the selected LUT.

LUTIndex

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to $(2^{LUTBitDepthIn} - 1)$
Default	0
Affected feature	LUTValue

Controls the index (offset) of coefficient to access in the selected LUT.

LUTInfo

This control provides active LUT information.

LUTAddress

Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Indicates location of memory, if LUT is loaded.

LUTBitDepthIn

Display name	LUTBitLengthIn
Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Bit depth of the input value of the LUT block.

LUTBitDepthOut

Display name	LUTBitLengthOut
Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Bit depth of the output value of the LUT block.

LUTSizeBytes

Display name	LUTSize
Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Memory size of the active LUT.

LUTLoadAll / LUTLoad

Origin of feature	Camera
Type	Command
Affected feature	LUTSaveAll

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

LUTMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Luminance, Red, Green, Blue</i>
Default	<i>Luminance</i>
Affected features	N/A

Selects on which pixels the selected LUT (depending on LUTSelector) will be 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.



To avoid confusion, especially with color cameras, we recommend the following steps:

1. Configure the LUT modes.
2. Enable the LUT.

LUTSaveAll / LUTSave

Origin of feature	Camera
Type	Command
Affected feature	LUTLoadAll

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



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

LUTSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>LUT1, LUT2, LUT3, LUT4, LUT5</i>
Default	<i>LUT1</i>
Affected features	LUTMode, LUTEnable, LUTIndex, LUTValue, LUTBitDepthIn, LUTBitDepthOut, LUTAddress, LUTSizeBytes

Selects which look-up table is used. These LUTs are camera specific.

LUTValue

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to ($2^{\text{LUTBitDepthOut}} - 1$)
Default	<i>4095</i>
Affected features	N/A

Returns or sets the value at entry *LUTIndex*.

NirMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, On_HighQuality, On_Fast</i>
Default	<i>Off</i>
Affected features	N/A

Select three different NIR modes. The modes differ in quantum efficiency, frame rates, and anti-blooming characteristics

Value	Description
<i>Off</i>	<p>NirMode set off. Acquire and readout image at same time.</p> <p>NIR sensitivity: No increased sensitivity in NIR range</p> <p>Anti-blooming characteristics: As specified by sensor manufacturer</p> <p>Usage: Best suited if you need very long exposure time</p>
<i>On_HighQuality</i>	<p>Cannot acquire and readout image at same time. The exposure time will always influence frame rate directly.</p> <p>NIR sensitivity: Increased NIR sensitivity, except for a very small portion of the exposure time, which is: $t_{\text{NormalQE}} = \text{MIN}(4300 \mu\text{s}, \text{ExposureTimeAbs}/4)$</p> <p>Anti-blooming characteristics: Very good if, ExposureAuto = <i>Off</i> Adaptively reduced if, ExposureTimeAbs < 13200 μs or ExposureAuto = <i>other</i></p> <p>Usage: Best suited for medium length exposure times and high-dynamic range (HDR) light conditions</p>
<i>On_Fast</i>	<p>Acquire and readout image at same time.</p> <p>NIR sensitivity: Increased NIR sensitivity during total exposure time</p> <p>Anti-blooming characteristics: Reduced anti-blooming characteristics</p> <p>Usage: Best suited for low-light applications and small exposure times, when high frame rate is desired</p>

Saturation

Origin of feature	Camera
Type	Float
Access	R/W
Range	0.00 to 2
Default	1
Affected features	N/A

Alters color intensity. Only valid when using on-camera interpolated pixel formats.

Value	Description
0	Monochrome
1	Default saturation
2	Maximum possible saturation that can be applied



Saturation puts gain to the color vectors in the U/V plane.

SubstrateVoltage

VsubValue

Origin of feature	Camera
Type	Integer
Access	R
Range	Camera dependent
Unit	mV
Affected features	N/A

CCD substrate voltage. Optimized by Allied Vision for each sensor.

Whitebalance

BalanceRatioAbs

Origin of feature	Camera
Type	Float
Access	R/W

Range	0.8 to 3
Affected features	N/A

Adjusts the gain of the channel selected in the `BalanceRatioSelector`.
`BalanceRatioAbs = 1` means no gain is applied.



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

BalanceRatioSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Red, Blue</i>
Default	<i>Red</i>
Affected feature	<code>BalanceRatioAbs</code>

Select the red or blue channel to adjust with `BalanceRatioAbs`.

BalanceWhiteAuto

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, Once, Continuous</i>
Default	<i>Off</i>
Affected features	N/A

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

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 <code>BalanceRatioSelector</code> and <code>BalanceRatioAbs</code> .
<i>Once</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . A single iteration of the auto white balance algorithm is run, and then <code>BalanceWhiteAuto</code> returns to <i>Off</i> . The <i>Once</i> value operates according to the <code>ExposureAuto</code> and <code>DSPSubregion</code> controls.
<i>Continuous</i>	Valid when <code>ExposureMode = Timed</code> or <code>PieceWiseLinearHDR</code> . White balance will continuously adjust according to the current scene. The <i>continuous</i> function operates according to the <code>ExposureAuto</code> and <code>DSPSubregion</code> controls.

BalanceWhiteAutoControl

BalanceWhiteAutoAdjustTol

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 50
Default	5
Unit	Percent
Affected features	N/A

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 occurring each image.

BalanceWhiteAutoRate

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 100 1 (slowest) to 100 (fastest)
Default	<i>100</i>
Unit	Percent
Affected features	N/A

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

DeviceStatus

DeviceTemperature

Origin of feature	Camera
Type	Float
Access	R
Unit	Degree Celsius
Resolution	0.031
Accuracy	±1 °C
Affected features	N/A

Camera's internal temperature.

DeviceTemperatureSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Main, Sensor</i>
Affected feature	DeviceTemperature

Selects the site whose temperature is reported by DeviceTemperature.

EventControl

The following table lists all the events supported by the camera.

EventData

Origin of feature		Camera		
Feature	Type	Access	Value	
EventAcquisitionEndFrameID	Integer	R/C	0	
EventAcquisitionEndTimestamp	Integer	R/C	0	
EventAcquisitionRecordTriggerFrameID	Integer	R/C	0	
EventAcquisitionRecordTriggerTimestamp	Integer	R/C	0	
EventAcquisitionStartFrameID	Integer	R/C	0	
EventAcquisitionStartTimestamp	Integer	R/C	0	
EventErrorFrameID	Integer	R/C	0	
EventErrorTimestamp	Integer	R/C	0	
EventExposureEndFrameID	Integer	R/C	0	
EventExposureEndTimestamp	Integer	R/C	0	
EventExposureStartFrameID	Integer	R/C	0	
EventExposureStartTimeStamp	Integer	R/C	0	
EventFrameTriggerFrameID	Integer	R/C	0	
EventFrameTriggerTimestamp	Integer	R/C	0	
EventLine1FallingEdgeFrameID	Integer	R/C	0	
EventLine1FallingEdgeTimestamp	Integer	R/C	0	
EventLine1RisingEdgeFrameID	Integer	R/C	0	
EventLine1RisingEdgeTimestamp	Integer	R/C	0	
EventLine2FallingEdgeFrameID	Integer	R/C	0	
EventLine2FallingEdgeTimestamp	Integer	R/C	0	
EventLine2RisingEdgeFrameID	Integer	R/C	0	
EventLine2RisingEdgeTimestamp	Integer	R/C	0	
EventLine3FallingEdgeFrameID	Integer	R/C	0	
EventLine3FallingEdgeTimestamp	Integer	R/C	0	

Feature	Type	Access	Value
EventLine3RisingEdgeFrameID	Integer	R/C	0
EventLine3RisingEdgeTimestamp	Integer	R/C	0
EventLine4FallingEdgeFrameID	Integer	R/C	0
EventLine4FallingEdgeTimestamp	Integer	R/C	0
EventLine4RisingEdgeFrameID	Integer	R/C	0
EventLine4RisingEdgeTimestamp	Integer	R/C	0
EventOverflowFrameID	Integer	R/C	0
EventOverflowTimestamp	Integer	R/C	0
EventPtpSyncLockedFrameID	Integer	R/C	0
EventPtpSyncLockedTimestamp	Integer	R/C	0
EventPtpSyncLostFrameID	Integer	R/C	0
EventPtpSyncLostTimestamp	Integer	R/C	0

EventID

EventAcquisitionEnd

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40001
Affected features	EventAcquisitionEndTimestamp, EventAcquisitionEndFrameID

EventAcquisitionRecordTrigger

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40004
Affected features	EventAcquisitionRecordTriggerTimestamp, EventAcquisitionRecordTriggerFrameID

EventAcquisitionStart

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40000
Affected features	EventAcquisitionStartTimestamp, EventAcquisitionStartFrameID

EventError

Origin of feature	Camera
Type	Integer
Access	R/C
Value	65535
Affected features	EventErrorTimestamp, EventErrorFrameID

The error event occurs if there is a problem on the camera; this event should be reported to technical support. If you use the message channel for event notification, you are always subscribed to this event.

EventExposureEnd

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40003
Affected features	EventExposureEndTimestamp, EventExposureEndFrameID

EventExposureStart

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40019
Affected features	EventExposureStartTimestamp, EventExposureStartFrameID
Vimba version	Vimba V1.4 or later

The Exposure Start event occurs when the exposure start event occurs.

EventFrameTrigger

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40002
Affected features	EventFrameTriggerTimestamp, EventFrameTriggerFrameID

EventFrameTriggerReady

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40018
Affected features	EventFrameTriggerReadyTimestamp, EventFrameTriggerReadyFrameID

The Frame Trigger event occurs when the camera is ready for another frame acquisition.

EventLine1FallingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40011
Affected features	EventLine1FallingEdgeTimestamp, EventLine1FallingEdgeFrameID

EventLine1RisingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40010
Affected features	EventLine1RisingEdgeTimestamp, EventLine1RisingEdgeFrameID

EventLine2FallingEdge

Origin of feature	Camera
Type	Integer

Access	R/C
Value	40013
Affected features	EventLine2FallingEdgeTimestamp, EventLine2FallingEdgeFrameID

EventLine2RisingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40012
Affected features	EventLine2RisingEdgeTimestamp, EventLine2RisingEdgeFrameID

EventLine3FallingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40015
Affected features	EventLine3FallingEdgeTimestamp, EventLine3FallingEdgeFrameID

EventLine3RisingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40014
Affected features	EventLine3RisingEdgeTimestamp, EventLine3RisingEdgeFrameID

EventLine4FallingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40017
Affected features	EventLine4FallingEdgeTimestamp, EventLine4FallingEdgeFrameID

EventLine4RisingEdge

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40016
Affected features	EventLine4RisingEdgeTimestamp, EventLine4RisingEdgeFrameID

EventOverflow

Origin of feature	Camera
Type	Integer
Access	R/C
Value	65534
Affected features	EventOverflowTimestamp, EventOverflowFrameID

The overflow event occurs when one or more notification events are lost on the camera. If you use the message channel for event notification, you are always subscribed to this event.

EventPtpSyncLocked

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40006
Affected features	EventPtpSyncLockedTimestamp, EventPtpSyncLockedFrameID

Camera has acquired synchronization to the master clock.

EventPtpSyncLost

Origin of feature	Camera
Type	Integer
Access	R/C
Value	40005
Affected features	EventPtpSyncLostTimestamp, EventPtpSyncLostFrameID

Camera has lost synchronization to the master clock.



If you use the message channel for event notification, you are always subscribed to *EventOverflow* and *EventError* events.



There is no mechanism to detect the loss of events during transportation. If mis-configured, cameras may produce lots of events; more than a PC can handle.

EventNotification

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>On, Off</i>
Default	<i>Off</i>
Affected feature	EventsEnable1

Activates event notification on the GigE Vision message channel.

EventSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>AcquisitionStart, AcquisitionEnd, AcquisitionRecordTrigger, ExposureStart, ExposureEnd, FrameTrigger, FrameTriggerReady, PtpSyncLocked, PtpSyncLost, Line1FallingEdge, Line2FallingEdge, Line3FallingEdge, Line4FallingEdge, Line1RisingEdge, Line2RisingEdge, Line3RisingEdge, Line4RisingEdge</i>
Default	<i>AcquisitionStart</i>
Affected features	EventNotification, EventsEnable1

Selects a specific event to be enabled or disabled using EventNotification.

EventsEnable1

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 4294967295
Default	0
Affected feature	EventNotification

Bit field of all events. For example:

<i>Bit 1</i>	EventAcquisitionStart
<i>Bit 2</i>	EventAcquisitionEnd
<i>Bit 3</i>	EventFrameTrigger
<i>Bit 19</i>	EventFrameTriggerReady

This is an alternative to setting each event individually using the EventNotification and EventSelector method.



Activate event-notification on the GigE Vision message channel. For programmers. See register documentation.

GigE

BandwidthControlMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>StreamBytesPerSecond, SCPD, Both</i>
Default	<i>StreamBytesPerSecond</i>
Affected features	N/A

Selects the desired mode of bandwidth control.

Value	Description
<i>StreamBytesPerSecond</i>	See the <i>StreamBytesPerSecond</i> feature for more information
<i>SCPD</i>	Stream channel packet delay expressed in timestamp counter units. This mode may be used to limit the rate of data from the camera to the host. It works by inserting a delay between successive stream channel packets, e.g. the longer the delay, the slower the data rate. This mode is NOT recommended
<i>Both</i>	Implements a combination of control modes. This mode is NOT recommended



Bandwidth allocation can be controlled by *StreamBytesPerSecond*, or by register *SCPD0*. If you do not understand *SCPD0* and how this driver uses this register, leave this set to *StreamBytesPerSecond*.

ChunkModeActive

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	<i>true, false</i>
Default	<i>false</i>
Affected features	<i>PayloadSize, NonImagePayloadSize</i>

Enables camera to send GigE Vision Standard Protocol chunk data with an image. *ChunkModeActive* is read-only during acquisition.

Currently implemented chunk data:

Byte	Description
Bytes 1 to 4	Acquisition count
Byte 5	<p>These 8 bits indicate the following EF lens settings:</p> <ul style="list-style-type: none"> • <i>Bit 7 (Error)</i>: When this bit is set to 1, the EF lens is in an error state, bits 2 to 5 indicate enumerated value of last error, and all other bits and bytes will be 0. • <i>Bit 6 (Lens attached)</i>: When this bit is set to 1, an EF lens is attached to camera. • <i>Bit 5 (Auto focus)</i>: When this bit is set to 1, the EF lens manual/auto focus switch is set to the auto focus position. • <i>Bits 2 to 4 (Last error)</i>: Enumerated error value: <ul style="list-style-type: none"> - 0: No error detected - 1: Lens failed query by camera - 2: Lens communication error (can occur when removing lens) - 3: Lens communication error (can occur when removing lens) - 4: Lens remained busy for longer than 10 seconds - 5: Lens focus "Zero Stop" not detected - 6: Lens focus "Infinity Stop" not detected • <i>Bits 0 to 1</i>: Upper 2 bits of focus percentage value (see Byte 6).
Byte 6	<p>These 8 bits in conjunction with bits 0 to 1 of Byte 5, indicate the current focus position of the EF lens in (percentage of maximum focus range) * 10 (i.e. 1000 = 100 percent = Infinity Stop).</p> <p>If the lens manual/auto focus switch is in the manual position these bits will be 0.</p>
Byte 7	These 8 bits indicate the current aperture position of the EF lens in Dn. To convert Dn to FStop value, use formula: $FStop = 2 (Dn - 8) / 16$.
Byte 8	These 8 bits indicate the current focal length of the EF lens in mm.
Bytes 9 to 12	Exposure value in μs .
Bytes 13 to 16	<p>Gain value in dB.</p> <p>For Prosilica GT1930, GT1930C, GT1930L and GT1930LC cameras: Gain value in tenths of dB (i.e. 201 represents 20.1 dB)</p>
Bytes 17 to 18	Sync-in levels. A bit field. Bit 0 is sync-in 0, bit 1 is sync-in 1, etc. A bit value of 1 = level high, and a bit value of 0 = level low.
Bytes 19 to 20	Sync-out levels. A bit field. Bit 0 is sync-out 0, bit 1 is sync-out 1, etc. A bit value of 1 = level high, and a bit value of 0 = level low.
Bytes 21 to 24	Reserved. 0
Bytes 25 to 28	Reserved. 0
Bytes 29 to 32	Reserved. 0
Bytes 33 to 36	Reserved. 0
Bytes 37 to 40	Reserved. 0
Bytes 41 to 44	Chunk ID. 1000
Bytes 45 to 48	Chunk length.

Configuration

GevIPConfigurationApply

Display name	IP Configuration Apply
Origin of feature	Driver
Type	Command
Affected features	N/A

Apply the IP configuration mode selected by `GevIPConfigurationMode`.

GevIPConfigurationMode

Display name	IP Configuration Mode
Origin of feature	Driver
Type	Enumeration
Access	R/W
Possible values	<i>LLA, DHCP, Persistent</i>
Affected features	N/A

Current IP configuration mode.

Current

GevCurrentDefaultGateway

Display name	Current Default Gateway
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

IP address of the default Gateway of the camera.

GevCurrentIPAddress

Display name	Current IP Address
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Current IP address of the camera.

GevCurrentSubnetMask

Display name	Current Subnet Mask
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Current subnet mask of the camera.

GVCP



GVCP: GigE Vision Control Protocol

Allied Vision GigE cameras have a sophisticated real time resend mechanism that ensures a high degree of data integrity.

GVCPCmdRetries

Display name	Command Retries
Origin of feature	Driver
Type	Integer
Access	R/W
Range	1 to 9
Default	5
Affected features	GevHeartbeatTimeout, GevHeartbeatInterval, GVCPHBInterval

Controls the maximum number of resend requests that the host will attempt when trying to recover a lost packet.

GVCPCmdTimeout

Display name	Command Timeout
Origin of feature	Driver
Type	Integer
Access	R/W
Range	100 to 1000
Default	<i>250</i>
Unit	ms
Affected features	GevHeartbeatTimeout, GevHeartbeatInterval, GVCPHBInterval

Timeout waiting for an answer from the camera.

GevHeartbeatInterval

Display name	Heartbeat Interval
Origin of feature	Driver
Type	Integer
Access	R/W
Range	200 to 1450
Default	<i>1450</i>
Unit	ms
Vimba version	Vimba V1.3 or later
Affected feature	GVCPHBInterval

The driver sends heartbeat packets to the camera every `GevHeartbeatInterval` milliseconds.

GevHeartbeatTimeout

Display name	Heartbeat Timeout
Origin of feature	Driver
Type	Integer
Access	R/W
Range	500 to 10000
Default	<i>3000</i>
Unit	ms
Vimba version	Vimba V1.3 or later
Affected features	GevHeartbeatInterval, GVCPHBInterval

The driver sends heartbeat packets to the camera. If a heartbeat packet is not received within `GevHeartbeatTimeout`, the camera assumes the host has closed its controlling application or is dead, and closes its stream and control channel.

This parameter may need to be increased if stepping through code in a debugger, as this prevents the driver from sending heartbeat packets.

GVCPHBInterval

Display name	Heartbeat Interval
Origin of feature	Driver
Type	Integer
Access	R/W
Range	500 to 5000
Default	<i>3000</i>
Unit	ms
Vimba version	Up to Vimba V1.2.1
Affected features	N/A

The driver sends a heartbeat request packet to the camera every `GVCPHBInterval` milliseconds. If the camera fails to respond to the heartbeat request, a retry is sent `GVCPCmdTimeout` ms later. After `GVCPCmdRetries` retries with no response, a camera unplugged event is returned by the driver.



This parameter can be increased significantly to bypass problems when debugging applications.

GevSCPSPacketSize

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	Camera dependent
Unit	Bytes
Affected features	StreamBytesPerSecond, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, StreamHoldCapacity, GVSPPacketSize

This parameter determines the Ethernet packet size. Generally, this number should be set to as large as the network card (or other involved active networking components) will allow. If this number is reduced, then CPU loading will increase. These large packet sizes (>1500) are called jumbo packets/frames in Ethernet terminology. If your GigE network card does not support jumbo packets/frames of at least 8228 bytes (the camera default on power up), then you will need to reduce the `GevSCPSPacketSize` parameter of the camera to match the maximum jumbo packet size supported by your GigE interface. A `GevSCPSPacketSize` of 1500 is a safe setting which all GigE network cards support.



If you are seeing all black images, or all frames reported as `StatFrameDropped` and zero images reported as `StatFrameDelivered`, you will likely need to decrease this parameter.

NonImagePayloadSize

Origin of feature	Camera
Type	Integer
Access	R
Range	0 to 4294967295
Unit	Bytes
Affected features	N/A

Maximum size of chunk data, not including the image chunk, in the image block payload. If `ChunkModeActive = false` then `NonImagePayloadSize = 0`.

PTP

Precision Time Protocol (PTP) manages clock synchronization of multiple devices across an Ethernet network, with $\pm 1 \mu\text{s}$ tolerance. Once the clocks of the devices are synchronized, a synchronous software trigger can be sent to Allied Vision cameras via the `PtpAcquisitionGateTime` control. On Allied Vision GigE cameras, the device clock is represented by the camera `GevTimeStampValue` feature.



For more information on PTP, see the IEEE 1588-2008 standard:

<http://standards.ieee.org/findstds/standard/1588-2008.html>

PtpAcquisitionGateTime

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to $(2^{63}-1)$
Default	0
Unit	ns
Affected features	N/A

`PtpAcquisition` trigger time. Used to schedule a synchronized software trigger on multiple PTP synchronized device. `PtpAcquisitionGateTime` must be set beyond current camera `GevTimeStampValue`, i.e., `GevTimeStampValue` \geq `PtpAcquisitionGateTime`. When set below `GevTimeStampValue`, image acquisition stalls. `PtpAcquisitionGateTime` resets to zero when `PtpMode` set to *Off*.

PtpMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Off, Slave, Master, Auto</i>
Default	<i>Off</i>
Affected feature	<code>PtpAcquisitionGateTime</code>

Controls the PTP device behavior.



If using the camera event channel, a `EventPtpSyncLost` is sent if `PtpMode` is changed. `EventPtpSyncLocked` is sent once PTP synchronization is re-established.

Value	Description
<i>Off</i>	This camera's <code>GevTimeStampValue</code> is not synchronized with any other device. <code>PtpAcquisitionGateTime</code> resets to zero.
<i>Slave</i>	This camera's <code>GevTimeStampValue</code> is altered to align with a master device's clock.
<i>Master</i>	This camera's <code>GevTimeStampValue</code> is the master clock. All other PTP enabled slave devices synchronize their clock to this camera.
<i>Auto</i>	This camera uses the IEEE 1588 best master clock algorithm to determine which camera is master, and which are slaves. It may be assigned as either. There may be several state transitions prior to synchronization.

PtpStatus

Origin of feature	Camera
Type	Enumeration
Access	R
Possible values	<i>Disabled, Initializing, Listening, Master, Passive, Uncalibrated, Slave</i>
Default	<i>Disabled</i>
Affected features	N/A

State of the PTP operation.

Value	Description
<i>Disabled</i>	Camera <code>PtpMode</code> is set to <i>Off</i> .
<i>Initializing</i>	PTP is being initialized. If camera / PTP device is being initialized, all devices statuses are set to initializing. This state appears very briefly.
<i>Listening</i>	Device is listening for other PTP enabled devices. The purpose of this state is to determine which device will act as master.
<i>Master</i>	Device acting as master clock. If a better master clock is determined, device will go to <i>Listening</i> , <i>Uncalibrated</i> , and finally <i>Slave</i> .
<i>Passive</i>	If there are two or more devices with <code>PtpMode = Master</code> , this device has an inferior clock and is not synchronized to the master.

Value	Description
<i>Uncalibrated</i>	PTP synchronization not yet achieved. Slave(s) are synchronizing with master.
<i>Slave</i>	PTP synchronization between this device and master is achieved. Device is acting as a slave to another device's master clock.



PTP capable cameras with firmware < 1.54.11026 have `PtpStatus = [Off, Master, Syncing, Slave, Error]`.

PayloadSize

Origin of feature	Camera
Type	Integer
Access	R
Unit	Bytes
Affected features	N/A

Total size of image block payload.

- If `ChunkModeActive = true`:
`PayloadSize = ImageSize + NonImagePayloadSize + 8`
- If `ChunkModeActive = false`:
`PayloadSize = ImageSize`

Persistent

GevPersistentDefaultGateway

Display name	Persistent Default Gateway
Origin of feature	Camera
Type	Integer
Access	R/W
Affected features	N/A

Persistent default gateway of the camera.

GevPersistentIPAddress

Display name	Persistent IP Address
Origin of feature	Camera
Type	Integer

Access	R/W
Affected features	N/A

Persistent IPv4 address of the camera.

GevPersistentSubnetMask

Display name	Persistent Subnet Mask
Origin of feature	Camera
Type	Integer
Access	R/W
Affected features	N/A

Persistent subnet mask of the camera.

StreamBytesPerSecond

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1,000,000 to 124,000,000 248,000,000 for Prosilica GX in LAG mode
Unit	Bytes/s
Affected features	AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

Moderates the data rate of the camera. This is particularly useful for slowing the camera down so that it can operate over slower links such as Fast Ethernet (100 Mb/s), or wireless networks. It is also an important control for multiple camera situations. When multiple cameras are connected to a single GigE port (usually through a switch), `StreamBytesPerSecond` for each camera needs to be set to a value so that the sum of each camera's `StreamBytesPerSecond` parameter does not exceed the data rate of the GigE port. Setting the parameter in this way will ensure that multiple-camera situations work without packet collisions, i.e. data loss.

To calculate the required minimum `StreamBytesPerSecond` setting for a camera in any image mode, use the following formula:

`StreamBytesPerSecond` = Height x Width x FrameRate x Bytes per Pixel

115,000,000 bytes/s is the typical maximum data rate for a GigE port. Beyond this setting, some network cards will drop packets.



If you are seeing occasional frames/packets reported as `StatFrameDropped` / `StatPacketMissed` you will likely need to decrease this parameter.

StreamFrameRateConstrain

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	true, false
Default	true
Affected features	AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

If *true*, the camera automatically limits frame rate to bandwidth, determined by *StreamBytesPerSecond*, to prevent camera buffer overflows and dropped frames. If *false*, the frame rate is not limited to bandwidth (only sensor readout time). Latter case is useful for *AcquisitionMode = Recorder* or *StreamHoldEnable = On* modes, as these modes are not bandwidth limited.

StreamHold

Normally, the camera sends data to the host PC immediately after completion of exposure. Enabling *StreamHold* delays the transmission of data, storing it in on-camera memory, until *StreamHold* is disabled.

This feature can be useful to prevent GigE network flooding in situations where a large number of cameras connected to a single host PC are capturing a single event. Using the *StreamHold* function, each camera will hold the event image data until the host PC disables *StreamHold* for each camera in turn.

StreamHoldCapacity

Origin of feature	Camera
Type	Integer
Access	R
Unit	Frames
Affected features	N/A

The maximum number of images (for the current size and format), which can be stored on the camera when *StreamHold* is enabled. Used when *AcquisitionMode = Recorder*, or *StreamHoldEnable = On*. This value is different for each camera depending on the camera internal memory size and the *ImageSize*.

StreamHoldEnable

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>On, Off</i>
Default	<i>Off</i>
Affected features	N/A

Control on-camera image storage; this control is like a “pause” button for the image stream.

Value	Description
<i>On</i>	Images remain stored on the camera, and are not transmitted to the host.
<i>Off</i>	The image stream resumes, and any stored images are sent to the host.

Timestamp

Allied Vision GigE cameras have a very accurate `timestamp` function for timestamping images.



Use PTP for synchronizing cameras.

GevTimestampControlLatch

Origin of feature	Camera
Type	Command
Affected feature	<code>GevTimestampControlReset</code>

Captures timestamp and stores in `GevTimestampValue`.

GevTimestampControlReset

Origin of feature	Camera
Type	Command
Affected feature	<code>GevTimestampControlLatch</code>

Resets the camera’s timestamp to 0. Not possible while PTP enabled; when `PtpMode` is set to *Master* or *Auto*.

GevTimestampTickFrequency

Origin of feature	Camera
Type	Integer
Access	R
Range	0 to 4294967295
Default	<i>Camera dependent</i>
Unit	Hz
Affected features	N/A

Frequency of image timestamp. The image timestamp can be useful for determining whether images are missing from a sequence due to missing trigger events. Cameras offering clock synchronization via PTP will have a `GevTimestampTickFrequency` of 1,000,000,000.

GevTimestampValue

Origin of feature	Camera
Type	Integer
Access	R
Unit	Camera clock ticks
Affected features	N/A

Value of timestamp, when latched by `GevTimestampControlLatch`.

IO

The control and readout of all camera inputs and outputs. The number of inputs and outputs is camera model dependent.

StatusLED

StatusLedLevels

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 4294967296
Default	0
Affected features	N/A

Status LED levels in GPO mode.



`StatusLedPolarity` can invert these values.

StatusLedPolarity

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Normal, Invert</i>
Affected features	N/A

Polarity applied to the status LED specified by `StatusLedSelector`.

StatusLedSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>StatusLed1</i>
Affected features	N/A

Select the status LED to be controlled with `StatusLedSource` and `StatusLedPolarity`.

StatusLedSource

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>GPO, AcquisitionTriggerReady, FrameTriggerReady, FrameTrigger, Exposing, FrameReadout, Imaging, Acquiring, LineIn1/2/3/4, CCDTemperatureOK, Strobe1</i>
Default	<i>Exposing</i>
Affected features	N/A

Signal source of the status LED specified by StatusLedSelector.

Value	Description
<i>GPO</i>	General purpose output.
<i>AcquisitionTriggerReady</i>	Active once the camera has been recognized by the host PC and is ready to start acquisition.
<i>FrameTriggerReady</i>	Becomes active when the camera is in a state that will accept the next frame 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>Exposing</i>	Exposure in progress.
<i>FrameReadout</i>	Becomes active at the start of frame readout.
<i>Imaging</i>	Exposing or frame readout. Active when the camera is exposing or reading out frame data.
<i>Acquiring</i>	Becomes active at the start of acquisition.
<i>LineIn1/2/3/4</i>	External input <i>Line1/2/3/4</i> .
<i>CCDTemperatureOK</i>	Only for cameras that support this feature: indicates if camera has reached the desired temperature value.
<i>Strobe1</i>	Source is strobe timing unit.

Strobe



Strobe is an internal signal generator for on-camera clocking functions. Valid when any of the `SyncOutSource` is set to `Strobe1`. Strobe allows the added functionality of duration and delay, useful when trying to synchronize a camera exposure to an external strobe.

StrobeDelay

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	0
Unit	μs
Affected features	N/A

Delay from strobe trigger to strobe output.

StrobeDuration

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	0
Unit	μs
Affected features	N/A

Duration of strobe signal.

StrobeDurationMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Source, Controlled</i>
Default	<i>Source</i>
Affected features	N/A

Mode of the strobe timing unit.

Value	Description
<i>Source</i>	Strobe duration is the same as source duration.
<i>Controlled</i>	Strobe duration is set by <i>StrobeDuration</i> .

StrobeSource

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>AcquisitionTriggerReady</i> , <i>FrameTriggerReady</i> , <i>FrameTrigger</i> , <i>Exposing</i> , <i>FrameReadout</i> , <i>Acquiring</i> , <i>LineIn1</i> , <i>LineIn2</i> , <i>LineIn3</i> , <i>LineIn4</i>
Default	<i>FrameTrigger</i>
Affected features	N/A

Associates the start of strobe signal with one of the following image capture events.

Value	Description
<i>AcquisitionTriggerReady</i>	Active once the camera has been recognized by the host PC and is ready to start acquisition.
<i>FrameTriggerReady</i>	Active when the camera is in a state that will accept the next frame trigger.
<i>FrameTrigger</i>	Active when an image has been initiated to start. This is the logic trigger signal inside of the camera. It is initiated by an external trigger or software trigger.
<i>Exposing</i>	Active for the duration of sensor exposure.
<i>FrameReadout</i>	Active for the duration of frame readout, i.e. the transferring of image data from the CCD to camera memory.
<i>Acquiring</i>	Active during the acquisition stream.
<i>LineIn1</i>	Active when there is an external trigger at line1.
<i>LineIn2</i>	Active when there is an external trigger at line2.
<i>LineIn3</i>	Active when there is an external trigger at line3.
<i>LineIn4</i>	Active when there is an external trigger at line4.



For detailed information see the camera spectral sensitivity plots provided in the camera technical manuals.

<https://www.alliedvision.com/en/support/technical-documentation.html>

SyncIn

Signal source of the strobe timing unit. See `SyncOutSource` for descriptions.

SyncInGlitchFilter

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 50000
Default	0
Unit	ns
Affected features	N/A

Ignores glitches on the `SyncIn` input line with pulse duration less than set value.



Setting `SyncInGlitchFilter` value increases latency of `FrameTrigger` by same amount.

SyncInLevels

Origin of feature	Camera
Type	Integer
Access	R
Affected features	N/A

A 4-bit register where each bit corresponds to a specific `SyncIn` input. For example, when this value returns 2 (0010), `SyncIn2` is high and all other sync input signals (`SyncIn1`, `SyncIn3`, `SyncIn4`) are low.

SyncInSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>SyncIn1, SyncIn2, SyncIn3, SyncIn4</i>
Default	<i>SyncIn1</i>
Affected feature	SyncInGlitchFilter

Select the sync-in line to control with SyncInGlitchFilter.

SyncOut

Used for synchronization with other cameras/devices or general purpose outputs.

SyncOutLevels

Origin of feature	Camera
Type	Integer
Access	R/W
Range	0 to 4294967295
Affected features	N/A

Output levels of hardware synchronization outputs, for output(s) in *GPO* mode.



SyncOutPolarity can invert the SyncOutLevels.

SyncOutPolarity

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Normal, Invert</i>
Default	<i>Normal</i>
Affected features	N/A

Polarity applied to the sync-out line specified by SyncOutSelector.

SyncOutSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>SyncOut1, SyncOut2, SyncOut3, SyncOut4</i>
Default	<i>SyncOut1</i>
Affected features	SyncOutSource, SyncOutPolarity

Selects the sync-out line to control with SyncOutSource, SyncOutPolarity.

SyncOutSource

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>GPO, AcquisitionTriggerReady, FrameTriggerReady, Exposing, FrameReadout, Imaging, Acquiring, LineIn1, LineIn2, LineIn3, LineIn4, Strobel, CCDTemperatureOK</i>
Affected features	N/A

Signal source of the sync-out line specified by SyncOutSelector.

Value	Description
<i>GPO</i>	General purpose output
<i>AcquisitionTriggerReady</i>	Active once the camera has been recognized by the host PC and is ready to start acquisition
<i>FrameTriggerReady</i>	Active when the camera is in a state that will accept the next frame trigger
<i>Exposing</i>	Active for the duration of sensor exposure
<i>FrameReadout</i>	Active during frame readout, i.e. the transferring of image data from the CCD to camera memory
<i>Imaging</i>	Active when the camera is exposing or reading out frame data
<i>Acquiring</i>	Active when acquisition start has been initiated
<i>LineIn1</i>	Active when there is an external trigger at Line1
<i>LineIn2</i>	Active when there is an external trigger at Line2

Value	Description
<i>LineIn3</i>	Active when there is an external trigger at Line3
<i>LineIn4</i>	Active when there is an external trigger at Line4
<i>Strobe1</i>	The output signal is controlled according to Strobe1 settings
<i>CCDTemperatureOK</i>	Only for cameras that support this feature: indicates if camera has reached the desired temperature value

ImageFormat

Height

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

Height of image.

HeightMax

Origin of feature	Camera
Type	Integer
Access	R
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Height, OffsetY

Maximum image height for the current image mode.

ImageSize

Origin of feature	Camera
Type	Integer
Access	R
Unit	Bytes
Affected features	N/A

Size of images for the current format and size.

OffsetX

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	0
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

Starting column of the readout region (relative to the first column of the sensor).

OffsetY

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	0
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

Starting row of the readout region (relative to the first row of the sensor).

PixelFormat

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Mono8, Mono10, Mono12, Mono12Packed, Mono14, BayerGB8, BayerRG8, BayerGR8, BayerBG8, BayerBG10, BayerGB12Packed, BayerGR12Packed, BayerGB12, BayerRG12, BayerGR12, RGB8Packed, BGR8Packed, RGBA8Packed, BGRA8Packed, RGB12Packed, YUV411Packed, YUV422Packed, YUV444Packed</i>
Affected features	BinningHorizontal, StreamHoldCapacity, PayloadSize, NonImagePayloadSize, WidthMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Width, OffsetX, BinningVertical, HeightMax, Height, OffsetY

There are various pixel formats that GigE cameras can output. Not all cameras have every format (see the technical manuals for details).

<i>Mono8</i>	One pixel of data for every byte. Monochrome. For color cameras with on-camera interpolation, luminance (Y) channel returned. Bit depth: 8
<i>Mono10</i>	One pixel of data for every two bytes, LSB aligned. Monochrome. For color cameras with on-camera interpolation, luminance (Y) channel returned. Bit depth: 10
<i>Mono12</i>	One pixel of data for every two bytes, LSB aligned. Monochrome. For color cameras with on-camera interpolation, luminance (Y) channel returned. Bit depth: 12
<i>Mono12Packed</i>	Two pixels of data for every three bytes. Monochrome. Does not support odd Width x Height. Bit depth: 12
<i>Mono14</i>	One pixel of data for every two bytes, LSB aligned. Monochrome. For color cameras with on-camera interpolation, luminance (Y) channel returned. Bit depth: 14
<i>BayerGB8</i>	Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 8

<i>BayerRG8</i>	Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 8
<i>BayerGR8</i>	Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 8
<i>BayerBG8</i>	Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 8
<i>BayerBG10</i>	One pixel of data every for two bytes, LSB aligned. Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 10
<i>BayerGB12Packed</i>	Two pixels of data for every three bytes. Raw, un-interpolated color. Interpolation performed by host software. Does not support odd Width or Height. Bit depth: 12
<i>BayerGR12Packed</i>	Two pixels of data for every three bytes. Raw, un-interpolated color. Interpolation performed by host software. Does not support odd Width or Height. Bit depth: 12
<i>BayerGB12</i>	One pixel of data for every two bytes, LSB aligned. Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 12
<i>BayerRG12</i>	One pixel of data every for two bytes, LSB aligned. Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 12
<i>BayerGR12</i>	One pixel of data for every two bytes, LSB aligned. Raw, un-interpolated color. Interpolation performed by host software. Bit depth: 12
<i>RGB8Packed</i>	One pixel of data for every three bytes. On-camera interpolated color. Bit depth: 8
<i>BGR8Packed</i>	One pixel of data for every three bytes. On-camera interpolated color. Bit depth: 8
<i>RGBA8Packed</i>	One pixel of data for every four bytes. On-camera interpolated color. Alpha channel (A) is fully opaque, 0xFF. Bit depth: 8

<i>BGRA8Packed</i>	One pixel of data for every four bytes. On-camera interpolated color. Alpha channel (A) is fully opaque, 0xFF. Bit depth: 8
<i>RGB12Packed</i>	One pixel of data for every six bytes, R, G, B channels LSB-aligned. On-camera interpolated color. Bit depth: 12
<i>YUV411Packed</i>	Four pixels of data for every six bytes. On-camera interpolated color. Data in YUV411 format. Bit depth: 8
<i>YUV422Packed</i>	Three pixels of data for every six bytes. On-camera interpolated color. Data in YUV422 format. Bit depth: 8
<i>YUV444Packed</i>	Two pixels of data for every six bytes. On-camera interpolated color. Data in YUV444 format. Bit depth: 8

Width

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit

Width of image.

WidthMax

Origin of feature	Camera
Type	Integer
Access	R
Unit	Pixels
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Width, OffsetX

Maximum image width for the current image mode. Horizontal binning, for example, will change this value.

ImageMode

BinningHorizontal

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	1
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, WidthMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Width, OffsetX

The horizontal binning factor. Binning is the summing of charge (for CCD sensors) or gray value (for CMOS sensors) of adjacent pixels on a sensor, giving a lower resolution image, but at full ROI. Image sensitivity is also improved due to summed pixel charge / gray value.



BinningHorizontal and DecimationHorizontal are mutually exclusive. Setting BinningHorizontal > 1 forces DecimationHorizontal to 1.

Color cameras only: Color information is lost while binning is active due to summing of adjacent different filtered pixels on the Bayer filter array.

BinningHorizontalMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	Sum, Average
Default	Sum
Affected feature	BinningVerticalMode

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

Value	Description
Sum	Binning is accomplished by summing the charge / gray value of adjacent pixels on sensor.
Average	Binning is accomplished by averaging the charge / gray value of adjacent pixels on sensor. This increases SNR by SQRT (number of binned pixels).

BinningVertical

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Default	1
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, HeightMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Height, OffsetY

The vertical binning factor. Binning is the summing of charge (for CCD sensors) or gray value (for CMOS sensors) of adjacent pixels on a sensor, giving a lower resolution image, but at full ROI. Image sensitivity is also improved due to summed pixel charge / gray value.



BinningVertical and DecimationVertical are mutually exclusive. Setting BinningVertical > 1 forces DecimationVertical to 1.

Color cameras only: Color information is lost while binning is active due to summing of adjacent different filtered pixels on the Bayer filter array.

BinningVerticalMode

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Sum, Average</i>
Default	<i>Sum</i>
Affected feature	BinningHorizontalMode

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

Value	Description
<i>Sum</i>	Binning is accomplished by summing the charge / gray value of adjacent pixels on sensor
<i>Average</i>	Binning is accomplished by averaging the charge / gray value of adjacent pixels on sensor. This increases SNR by SQRT (number of binned pixels).

DecimationHorizontal

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 8
Default	1
Affected features	BinningHorizontal, StreamHoldCapacity, PayloadSize, NonImagePayloadSize, WidthMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Width, ExposureAutoMin, ExposureAutoMax, OffsetX, DefectMaskEnable

Decimation (also known as sub-sampling) is the process of skipping neighboring pixels (with the same color) while being read out from the CCD chip. `DecimationHorizontal` controls the horizontal sub-sampling of the image. There is no increase in the frame rate with horizontal sub-sampling.

Value	Description
1	Off
2	2x reduction factor. 2 of 4 columns displayed.
4	4x reduction factor. 2 of 8 columns displayed.
8	8x reduction factor. 2 of 16 columns displayed.



Writing an invalid number for `DecimationHorizontal` will round up to next valid mode. For example, 5 rounds up to 8. `DecimationHorizontal` and `BinningHorizontal` are mutually exclusive. Setting `DecimationHorizontal` > 1 forces `BinningHorizontal` to 1.

DecimationVertical

Origin of feature	Camera
Type	Integer
Access	R/W
Range	1 to 8
Default	1
Affected features	BinningVertical, StreamHoldCapacity, PayloadSize, NonImagePayloadSize, HeightMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Height, ExposureAutoMin, ExposureAutoMax, OffsetY, DefectMaskEnable

Decimation (also known as sub-sampling) is the process of skipping neighboring pixels (with the same color) while being read out from the CCD chip. `DecimationVertical` controls the vertical sub-sampling of the image. There is increase in frame rate with vertical sub-sampling.

Value	Description
1	Off
2	2x reduction factor. 2 of 4 columns displayed.
4	4x reduction factor. 2 of 8 columns displayed.
8	8x reduction factor. 2 of 16 columns displayed.



Writing an invalid number for `DecimationVertical` will round up to next valid mode. For example, 5 rounds up to 8. `DecimationVertical` and `BinningVertical` are mutually exclusive. Setting `DecimationVertical > 1` forces `BinningVertical` to 1.



For more information on the decimation process, see the *Decimation* application note at:

<https://www.alliedvision.com/en/support/technical-papers-knowledge-base.html>

ReverseX

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	true, false
Default	false
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, WidthMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Width, OffsetX

Flips the image sent by camera horizontally. The ROI is applied after flipping.

ReverseY

Origin of feature	Camera
Type	Boolean
Access	R/W
Possible values	true, false
Default	false
Affected features	StreamHoldCapacity, PayloadSize, NonImagePayloadSize, HeightMax, ImageSize, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, Height, OffsetX

Flips the image sent by camera vertically. The ROI is applied after flipping.

SensorHeight

Origin of feature	Camera
Type	Integer
Access	R/C
Affected feature	DSPSubregionBottom

The total number of pixel rows on the sensor.

Example: 1216

SensorTaps

Origin of feature	Camera
Type	Integer
Access	R/W
Range	Camera dependent
Affected features	N/A

Number of taps of the camera sensor.

SensorWidth

Origin of feature	Camera
Type	Integer
Access	R/C
Affected feature	DSPSubregionRight

The total number of pixel columns on the sensor.

Example: 1936

Info

GevDeviceMACAddress

Display name	Device MAC address
Origin of feature	Driver
Type	Integer
Access	R/C
Affected features	N/A

48-bit MAC address of the GVCP interface of the selected remote device.

DeviceFirmwareVersion

Origin of feature	Camera
Type	String
Access	R/C
Affected features	N/A

Firmware version of this Allied Vision GigE camera.

Example: 00.01.54.1594

DeviceID

Origin of feature	Camera
Type	String
Access	R/C
Affected features	N/A

Serial number of the camera.

DeviceModelName

Origin of feature	Camera
Type	String
Access	R/C
Affected features	N/A

Camera model name. Software should use the DevicePartNumber to distinguish between models.

Example: GT2450C

DevicePartNumber

Origin of feature	Camera
Type	String
Access	R/C
Affected features	N/A

Manufacturer's part number.

DeviceScanType

Origin of feature	Camera
Type	Enumeration
Access	R/C
Affected features	N/A

Scan type of the camera.

Example: Areascan

DeviceUserID

Origin of feature	Camera
Type	String
Access	R/W
Affected features	N/A

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

DeviceVendorName

Origin of feature	Camera
Type	String
Access	R/C
Affected features	N/A

Manufacturer's name.

Example: Allied Vision Technologies

FirmwareVerBuild

Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Build information.

Example: 1.54.**15954**

FirmwareVerMajor

Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Major part of the firmware version number (part before the decimal).

Example: **1**.54.15954

FirmwareVerMinor

Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Minor part of firmware version number (part after the decimal).

Example: 1.**54**.15954

SensorBits

Origin of feature	Camera
Type	Integer
Access	R/C
Affected features	N/A

Maximum bit depth of sensor.

SensorType

Origin of feature	Camera
Type	Enumeration
Access	R/C
Affected features	N/A

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

Example: Mono

SavedUserSets

Allied Vision GigE cameras are capable of storing a number of 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.



LUT features cannot be saved. To save the content of a LUT, use `Controls/LUTControl/LUTSave` or `LUTSaveAll`.

UserSetDefaultSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Default, UserSet1, UserSet2, UserSet3, UserSet4, UserSet5</i> The number of user sets is camera dependent.
Affected features	See Vimba UI

On power up or reset, this user set is loaded.

UserSetLoad

Origin of feature	Camera
Type	Command
Affected features	See Vimba UI

Loads camera parameters from the user set specified by `UserSetSelector`.

UserSetSave

Origin of feature	Camera
Type	Command
Affected features	See Vimba UI

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

UserSetSelector

Origin of feature	Camera
Type	Enumeration
Access	R/W
Possible values	<i>Default, UserSet1, UserSet2, UserSet3, UserSet4, UserSet5</i> The number of user sets is camera dependent.
Affected features	See Vimba UI

Selects a user set, for loading or saving camera parameters.

Stream

Info

GVSPFilterVersion

Display name	GVSP Filter Version
Origin of feature	Driver
Type	String
Access	R/C
Affected features	N/A

Version of the GVSP filter driver.

Example: 01.24.17

Multicast

Multicast mode allows the camera to send image data to all hosts on the same subnet as the camera. The host PC (or Vimba Viewer application instance) that first enables multicast mode is the master, and controls all camera parameters. All other hosts/instances are the monitors, and can view image data only.



Most GigE switches support a maximum `PacketSize` of 1500 bytes in multicast mode.



When using clients with Linux, you have to configure the IP subsystem to process multicast IP traffic.

MulticastEnable

Display name	Multicast Enable
Origin of feature	Driver
Type	Boolean
Access	R/W
Possible values	<code>true</code> , <code>false</code>
Default	<code>false</code>
Affected features	N/A

Enables multicast mode. In multicast mode all PCs on the same subnet as the camera can receive image data from the camera `MulticastIPAddress`.

MulticastIPAddress

Display name	Multicast IP Address
Origin of feature	Driver
Type	Integer
Access	R/C
Affected features	N/A

Sets the multicast IPv4 address.

Settings



GVSP: GigE Vision Streaming Protocol

GVSPAdjustPacketSize

Display name	GVSP Adjust Packet Size
Origin of feature	Driver
Type	Command
Affected features	N/A

Requests the packet size used to be adjusted automatically.

GVSPBurstSize

Display name	GVSP Burst Size
Origin of feature	Driver
Type	Integer
Access	R/W
Enumeration	1 to 256
Default	32
Unit	GVSP Packets
Affected features	N/A

Maximum number of GVSP packets to be processed in a burst.

GVSPDriver

Display name	GVSP Driver Selector
Origin of feature	Driver
Type	Enumeration
Access	R/W
Possible values	<i>Filter, Socket</i>
Default	<i>Filter</i>
Affected features	N/A

Streaming driver to be used.

GVSPHostReceiveBuffers

Display name	GVSP Host Receive Buffers
Origin of feature	Driver
Type	Integer
Access	R/W
Range	256 to 2048
Default	<i>512</i>
Affected features	N/A

Number of buffers to be used by the network socket. Only applicable when not using the filter driver.

GVSPMaxLookBack

Display name	GVSP Max Look Back
Origin of feature	Driver
Type	Integer
Access	R/W
Range	1 to 1024
Default	<i>30</i>
Unit	GVSP Packets
Affected features	N/A

Size of the look back window, in packets, when determining if a stream packet is missing. When a stream packet arrives out of order, the driver skips back `GVSPMaxLookBack` packets to see if the packets previous to this point have all arrived. If not, a resend is issued. A lower value allows the driver less time to assemble out-of-order packets; a larger value allows the driver more time. If the value is set too low, the driver will issue unnecessary resends. If the value is set too

high and a packet truly is missing, the driver will issue a resend but the camera may no longer have the required packet in its resend buffer and the packet will be dropped. The ideal value is system dependent.

GVSPMaxRequests

Display name	GVSP Max Requests
Origin of feature	Driver
Type	Integer
Access	R/W
Range	1 to 512
Default	3
Affected features	N/A

The maximum number of resend requests that the host will attempt before marking a packet dropped.

GVSPMaxWaitSize

Display name	GVSP Max Wait Size
Origin of feature	Driver
Type	Integer
Access	R/W
Range	8 to 1024
Default	100
Unit	GVSP Packets
Affected features	N/A

Maximum number of received GVSP packets following a resend request to wait before requesting again.

GVSPMissingSize

Display name	GVSP Missing Size
Origin of feature	Driver
Type	Integer
Access	R/W
Range	0 to 1024 0 = OFF
Default	512
Unit	GVSP Packets
Affected features	N/A

Maximum number of simultaneous missing GVSP packets before dropping the frame.

GVSPPacketSize

Display name	GVSP Packet Size
Origin of feature	Driver
Type	Integer
Access	R/W
Range	Camera dependent
Default	Camera dependent
Unit	Bytes
Affected features	GevSCPSPacketSize, StreamBytesPerSecond, AcquisitionFrameRateAbs, ExposureTimeAbs, AcquisitionFrameRateLimit, StreamHoldCapacity

GVSP packet size.

GVSP TiltingSize

Display name	GVSP Tilting Size
Origin of feature	Driver
Type	Integer
Access	R/W
Range	0 to 1024 0 = OFF
Default	100
Unit	GVSP Packets
Affected features	N/A

Maximum number of GVSP packets received from a following frame before dropping the frame.

GVSP Timeout

Display name	GVSP Timeout
Origin of feature	Driver
Type	Integer
Access	R/W
Range	10 to 5000
Default	70
Unit	ms
Affected features	N/A

End of stream timeout. If no stream packet received before `GVSPTimeout`, host requests resend, up to `GVSPMaxRequests` times. If still no packet received from camera, packet is marked as dropped.

Statistics



The packet counts in these statistics cover the image transport. Packets used for camera control or event data are not counted. All counters are reset at `AcquisitionStart`.

StatFrameRate

Display name	Stat Frame Rate
Origin of feature	Driver
Type	Float

Access	R
Affected features	N/A

Rate at which the camera is acquiring frames, derived from the frame timestamps.

StatFrameDelivered

Display name	Stat Frames Delivered
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of error-free frames captured since the start of imaging.

StatFrameDropped

Display name	Stat Frames Dropped
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of incomplete frames received by the host due to missing packets (not including shoved frames).

StatFrameRescued

Display name	Stat Frames Rescued
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of frames that initially had missing packets but were successfully completed after packet resend.

StatFrameShoved

Display name	Stat Frames Shoved
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of frames dropped because the transfer of a following frame was completed earlier.

StatFrameUnderrun

Display name	Stat Frames Underrun
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of frames missed due to the non-availability of a user supplied buffer.

StatLocalRate

Display name	Stat Local Rate
Origin of feature	Driver
Type	Float
Access	R
Affected features	N/A

Inverse of time interval between the last two frames (faulty or not) received by the host. No averaging is performed.



In case of error-free frame reception, `StatLocalRate` is similar to `StatFrameRate`, except that the host clock is used instead of frame timestamps for measuring the time interval between frames. Otherwise, `StatLocalRate` and `StatFrameRate` may differ significantly.

StatPacketErrors

Display name	Stat Packets Errors
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of improperly formed packets. If this number is non-zero, it suggests a possible cable or camera hardware failure.

StatPacketMissed

Display name	Stat Packets Missed
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of packets missed since the start of imaging.



If everything is configured correctly, this number should remain zero, or at least very low compared to StatPacketReceived.

StatPacketReceived

Display name	Stat Packets Received
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of error-free packets received by the driver since the start of imaging, this number should grow steadily during continuous acquisition.

StatPacketRequested

Display name	Stat Packets Requested
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of missing packets that were requested to be resent from the camera.



If everything is configured correctly, this number should remain zero, or at least very low compared to `StatPacketReceived`.

StatPacketResent

Display name	Stat Packets Resent
Origin of feature	Driver
Type	Integer
Access	R
Affected features	N/A

Number of packets resent by the camera since the start of imaging.

StatTimeElapsed

Display name	Stat Time Elapsed
Origin of feature	Driver
Type	Float
Access	R
Unit	Seconds
Affected features	N/A

Elapsed time since the stream was started.

StreamInformation

StreamID

Display name	Stream ID
Origin of feature	Driver
Type	String
Access	R/C
Vimba version	Vimba V1.3 or later
Affected features	N/A

Camera's unique ID for the stream.

StreamType

Display name	Stream Type
Origin of feature	Driver
Type	Enumeration
Access	R/C
Vimba version	Vimba V1.3 or later
Affected features	N/A

Identifies the transport layer technology of the stream.

Example: GEV

Index

A

Abbreviations	13
Acquisition	16
AcquisitionAbort	16
AcquisitionFrameCount	16
AcquisitionFrameRateAbs	16
AcquisitionFrameRateLimit	17
AcquisitionMode	17
AcquisitionStart	18
AcquisitionStop	18
RecorderPreEventCount	19
SensorShutterMode	19
AcquisitionAbort	16
AcquisitionFrameCount	16
AcquisitionFrameRateAbs	16
AcquisitionFrameRateLimit	17
AcquisitionMode	17
AcquisitionStart	18, 121
AcquisitionStop	18
Anti-blooming characteristics	63

B

BalanceWhiteAutoControl	
BalanceWhiteAutoAdjustTol	66
BalanceWhiteAutoRate	67
BinningHorizontal	104
BinningHorizontalMode	104
BinningVerticalMode	105
BlackLevel	26
BlackLevelControl	26
BlackLevel	26
BlackLevelSelector	26
BlackLevelSelector	26
BufferHandlingControl	25
StreamAnnounceBufferMinimum	25
StreamAnnouncedBufferCount	25
StreamBufferHandlingMode	25

C

CCDTemperatureOK	26
ColorTransformationControl	27
ColorTransformationMode	27
ColorTransformationSelector	27
ColorTransformationValue	28

ColorTransformationValueSelector	28
ColorTransformationMode	27
ColorTransformationSelector	27
ColorTransformationValue	28
ColorTransformationValueSelector	28
Contact us	7
Control	
BlackLevelControl	26
LUTControl	59
Controls	26
CCDTemperatureOK	26
ColorTransformationControl	27
DefectMask	31
DefectMaskEnable	31
DSPSubregion	29
EdgeFilter	30
EFLensControl	32
Exposure	38
FpncEnable	47
GainGontrol	47
Gamma	51
Hue	52
IODMode	52
Iris	53
LensDrive	57
LUTControl	59
NirMode	62
Saturation	64
SubstrateVoltage	64
Whitebalance	64

D

DecimationHorizontal	106
DecimationVertical	107
DefectMask	31
DefectMaskColumnEnable	31
DefectMaskPixelEnable	32
DefectMaskColumnEnable	31
DefectMaskEnable	31
DefectMaskPixelEnable	10, 32
DeviceFirmwareVersion	110
DeviceID	110
DeviceModelName	110
DevicePartNumber	111
DeviceScanType	111

DeviceStatus	68	EFLensFStopStepSize	34
DeviceTemperature	68	EFLensID	36
DeviceTemperatureSelector	68	EFLensInitialize	36
DeviceUserID	111	EFLensLastError	37
Document history	10	EFLensState	37
DSPSubregion	39, 48, 66	EFLensStatus	36
DSPSubregionBottom	29	EFLensID	36
DSPSubregionLeft	29	EFLensLastError	37
DSPSubregionRight	29	EFLensState	37
DSPSubregionTop	30	EFLensZoom	38
DSPSubregionBottom	29	EFLensZoomCurrent	38
DSPSubregionLeft	29	EFLensZoomMax	38
DSPSubregionRight	29	EFLensZoomMin	38
DSPSubregionTop	30	EFLensZoomCurrent	38
E		EFLensZoomMax	38
EFLensControl	32	EFLensZoomMin	38
EFLensFocus	34	Ethernet packet size	83
EFLensFStop	32	EventControl	69
EFLensInitialize	36	EventData	69
EFLensStatus	36	EventID	70
EFLensZoom	38	EventNotification	75, 76
EFLensFocus		EventSelector	76
EFLensFocusCurrent	34	EventsEnable1	76
EFLensFocusDecrease	34	EventID	
EFLensFocusIncrease	34	EventAcquisitionEnd	70
EFLensFocusMax	35	EventAcquisitionRecordTrigger	70
EFLensFocusMin	35	EventAcquisitionStart	71
EFLensFocusStepSize	35	EventError	71
EFLensFocusSwitch	36	EventExposureEnd	71
EFLensFocusCurrent	34	EventExposureStart	71
EFLensFocusDecrease	34	EventFrameTrigger	72
EFLensFocusIncrease	34	EventFrameTriggerReady	72
EFLensFocusMax	35	EventLine1FallingEdge	72
EFLensFocusMin	35	EventLine1RisingEdge	72
EFLensFocusStepSize	35	EventLine2FallingEdge	72
EFLensFocusSwitch	36	EventLine2RisingEdge	73
EFLensFStop	32	EventLine3FallingEdge	73
EFLensFStopCurrent	32	EventLine3RisingEdge	73
EFLensFStopDecrease	33	EventLine4FallingEdge	73
EFLensFStopIncrease	33	EventLine4RisingEdge	74
EFLensFStopMax	33	EventOverflow	74
EFLensFStopMin	33	EventPtpSyncLocked	74
EFLensFStopStepSize	34	EventPtpSyncLost	75
EFLensFStopCurrent	32, 34	Exposing	92, 97
EFLensFStopDecrease	33, 34	Exposure	38
EFLensFStopIncrease	33, 34	ExposureAuto	38
EFLensFStopMax	33	ExposureAutoControl	39
EFLensFStopMin	33	ExposureMode	42

ExposureTimeAbs	43	GainSelector	50
ExposureTimeIncrement	43	Gamma	51
ExposureTimePWL1	44	General purpose output	97
ExposureTimePWL2	44	GevCurrentDefaultGateway	79
Shutter	46	GevCurrentIPAddress	79
ThresholdPWL1	45	GevCurrentSubnetMask	80
ExposureAuto	38, 39, 48, 66	GevDeviceMACAddress	110
ExposureAutoControl	39, 48	GevHeartbeatInterval	81
ExposureAutoAdjustTol	39	GevHeartbeatTimeout	82
ExposureAutoAlg	40	GevIPConfigurationApply	79
ExposureAutoMax	40	GevIPConfigurationMode	79
ExposureAutoMin	41	GevPersistentDefaultGateway	86
ExposureAutoOutliers	41	GevPersistentIPAddress	86
ExposureAutoRate	41	GevPersistentSubnetMask	87
ExposureAutoTarget	42	GevSCPSPacketSize	83
ExposureAutoMax	39, 48	GevTimestampControlLatch	89
ExposureAutoTarget	39, 40	GevTimestampControlReset	89
ExposureMode	53	GevTimestampTickFrequency	90
ExposureTimeAbs	42	GevTimestampValue	90
ExposureTimePWL1	43	GigE	77
ExposureTimePWL2	43	BandwidthControlMode	77
F		ChunkModeActive	77, 83
FirmwareVerBuild	112	Configuration	79
FirmwareVerMajor	112	Current	79
FirmwareVerMinor	112	GVCP	80
FitRange	40	Persistent	86
FocusTimedFar	57, 58	StreamBytesPerSecond	87
FocusTimedNear	57, 58	StreamHold	88
FrameRate	87	Timestamp	89
FrameReadout	92, 97	GigE switch	116
FrameStart	42	GigE Vision Control Protocol (GVCP)	80
FrameTrigger	92	GPO	97
FrameTriggerReady	92, 97	GVCP interface MAC address	110
G		GVCPCmdRetries	80, 82
GainAuto	48, 53	GVCPCmdTimeout	81, 82
GainAutoControl		GVCPHInterval	82
GainAutoAdjustTol	48	GVSPAdjustPacketSize	117
GainAutoMax	49	GVSPBurstSize	117
GainAutoMin	49	GVSPDriver	118
GainAutoOutliers	49	GVSPFilterVersion	116
GainAutoRate	50	GVSPHostReceiveBuffers	118
GainAutoTarget	50	GVSPMaxLookBack	118
GainControl	47	GVSPMaxRequests	119, 121
Gain	47	GVSPMaxWaitSize	119
GainAuto	47	GVSPMissingSize	120
GainAutoControl	48	GVSPPacketSize	120
		GVSPtiltingSize	121
		GVSPTimeout	121

H	
Height	99
HeightMax	99
Hue	52
I	
ImageFormat	99
Height	99
HeightMax	99
ImageSize	99
OffsetX	100
OffsetY	100
PixelFormat	101
Width	103
WidthMax	103
ImageMode	104
BinningHorizontal	104
BinningHorizontalMode	104
BinningVertical	105
BinningVerticalMode	105
DecimationHorizontal	106
DecimationVertical	107
ReverseX	108
ReverseY	108
SensorHeight	108
SensorTaps	109
SensorWidth	109
ImageSize	86, 88, 99
Imaging	92, 97
Info	110
DeviceFirmwareVersion	110
DeviceID	110
DeviceModelName	110
DevicePartNumber	111
DeviceScanType	111
DeviceUserID	111
DeviceVendorName	111
FirmwareVerBuild	112
FirmwareVerMajor	112
FirmwareVerMinor	112
GevDeviceMACAddress	110
GVSPFilterVersion	116
SensorBits	112
SensorType	113
IO	91
StatusLED	91
Strobe	93
SyncIn	95
SyncOut	96
IO > SyncIn	
SyncInLevels	95
IODMode	52
Iris	
IrisAutoTarget	53
IrisMode	54
IrisVideoLevel	54
IrisVideoLevelMax	55
IrisVideoLevelMin	55
LensDCIris	56
LensPIris	56
IrisAutoTarget	55
IrisMode	39, 48, 53
IrisTimedClose	57, 58
IrisTimedOpen	57, 58
J	
Jumbo Packets	83
L	
Legal notice	2
LensDCIris	
LensDCDriveStrength	56
LensDrive	57
LensDriveCommand	57
LensDriveDuration	58
LensVoltage	58
LensVoltageControl	58
LensDriveCommand	
ZoomTimedOut	57
LensDriveDuration	58
LensPIris	
LensPIrisFrequency	56
LensPIrisNumSteps	57
LensPIrisPosition	57
LensPIrisNumSteps	57
LineIn1	97
LineIn2	97
LineIn3	98
LineIn4	98
LUTControl	59
LUTEnable	59
LUTIndex	59, 62
LUTInfo	60
LUTLoad	61
LUTMode	61
LUTSave	61
LUTSelector	61, 62

LUTValue	62
LUTInfo	
LUTAddress	60
LUTBitDepthIn	60
LUTBitDepthOut	60
LUTSizeBytes	60
M	
Mean	40
Multicast	
MulticastEnable	116
MulticastIPAddress	116, 117
MulticastEnable	116
MulticastIPAddress	117
N	
NonImagePayloadSize	83, 86
Non-volatile memory	114
O	
OffsetX	100
OffsetY	100
On-camera memory	88
P	
PayloadSize	86
PieceWiseLinearHDR	39, 42, 43, 48, 66
PlrisAuto	48, 53, 54, 57
PlrisManual	54, 57
PixelFormat	101
Ptp	84
PtpAcquisitionGateTime	84
PtpMode	84, 89
PtpStatus	85
R	
Recorder	88
RecorderPreEventCount	19
ReverseX	108
ReverseY	108
S	
Saturation	64
SavedUserSets	114
UserSetDefaultSelector	114
UserSetLoad	114
UserSetSave	114
UserSetSelector	115
Scan type	111

SCPD	77
Sensor	
Bit depth	112
Taps	109
Type	113
SensorBits	112
SensorHeight	108
SensorShutterMode	19
SensorTaps	109
SensorType	113
SensorWidth	109
Settings	
GVSPAdjustPacketSize	117
GVSPBurstSize	117
GVSPDriver	118
GVSPHostReceiveBuffers	118
GVSPMaxLookBack	118
GVSPMaxRequests	119
GVSPMaxWaitSize	119
GVSPMissingSize	120
GVSPPacketSize	120
GVSPTiltingSize	121
GVSPTimeout	121
StatFrameDelivered	122
StatFrameDropped	122
StatFrameRate	121, 123
StatFrameRescued	122
StatFrameShoved	123
StatFrameUnderrun	123
Statistics	
StatFrameDelivered	122
StatFrameDropped	122
StatFrameRate	121
StatFrameRescued	122
StatFrameShoved	123
StatFrameUnderrun	123
StatLocalRate	123
StatPacketErrors	124
StatPacketMissed	124
StatPacketReceived	124
StatPacketRequested	125
StatPacketResent	125
StatTimeElapsed	125
StatLocalRate	123
StatPacketErrors	124
StatPacketMissed	124
StatPacketReceived	124, 125
StatPacketRequested	125

StatPacketResent	125
StatTimeElapsed	125
StatusLED	
StatusLedLevels	91
StatusLedPolarity	91
StatusLedSelector	91
StatusLedSource	92
StatusLedLevels	91
StatusLedPolarity	91
StatusLedSelector	91
StatusLedSource	92
Stream	116
Info	116
Multicast	116
Settings	117
Statistics	121
Stream channel packet delay (SCPD)	77
Stream ID	126
StreamAnnounceBufferMinimum	25
StreamAnnouncedBufferCount	25
StreamBufferHandlingMode	25
StreamBytesPerSecond	77, 87, 88
StreamFrameRateConstrain	88
StreamHold	88
StreamHoldCapacity	88
StreamHoldEnable	88, 89
StreamHoldCapacity	88
StreamHoldEnable	89
StreamInformation	126
StreamID	126
StreamType	126
Strobe	
StrobeDelay	93
StrobeDuration	93, 94
StrobeDurationMode	93
StrobeSource	94
Strobe1	92, 93, 97, 98
StrobeDelay	93
StrobeDuration	93
StrobeDurationMode	93
StrobeSource	94
Styles	13
SubstrateVoltage	
VsubValue	64
Symbols	13
SyncIn	
SyncInGlitchFilter	95, 96
SyncInSelector	96

SyncInLevels	95
SyncInSelector	96
SyncOut	
SyncOutLevels	96
SyncOutPolarity	96, 97
SyncOutSelector	96, 97
SyncOutSource	93, 95, 97
SyncOutLevels	96
SyncOutPolarity	96
SyncOutSelector	97
SyncOutSource	97

T

Third-party software	14
Timestamp	77
GevTimestampControlLatch	89, 90
GevTimestampControlReset	89
GevTimestampTickFrequency	90
GevTimeStampValue	84, 85
GevTimestampValue	90
Timestamp function	89
Transport layer technology	126
Trigger	21
TriggerActivation	21
TriggerDelayAbs TriggerDelayAbs	21
TriggerMode	22
TriggerOverlap	22
TriggerSelector	23, 42
TriggerSoftware	23
TriggerSource	23, 42
TriggerActivation	21
TriggerMode	22
TriggerOverlap	22
TriggerSelector	23
AcquisitionEnd	23
TriggerSoftware	23
TriggerSource	23

U

UserSetDefaultSelector	114
UserSetLoad	114
UserSetSave	114
UserSetSelector	115

V

VideoClosed	54
VideoOpen	54

W

Whitebalance	64
BalanceRatioAbs	64, 65, 66
BalanceRatioSelector	65, 66
BalanceWhiteAuto	65
BalanceWhiteAutoControl	66

Width	103
-------------	-----

WidthMax	103
----------------	-----

Z

ZoomTimedIn	57, 58
-------------------	--------

ZoomTimedOut	58
--------------------	----