



MIPI CSI-2, GIGE VISION, AND USB3 VISION CAMERAS

# Alvium

## Features Reference

V3.0.0

Alvium CSI-2:  
00.13.00.849ffda0

Alvium G1, G5/G5X, USB:  
00.13.00.71d891fe

# This document at a glance



## Read this document carefully

Learn to avoid damage to your camera and use it in the most safe and efficient way.

## Features with Vimba X

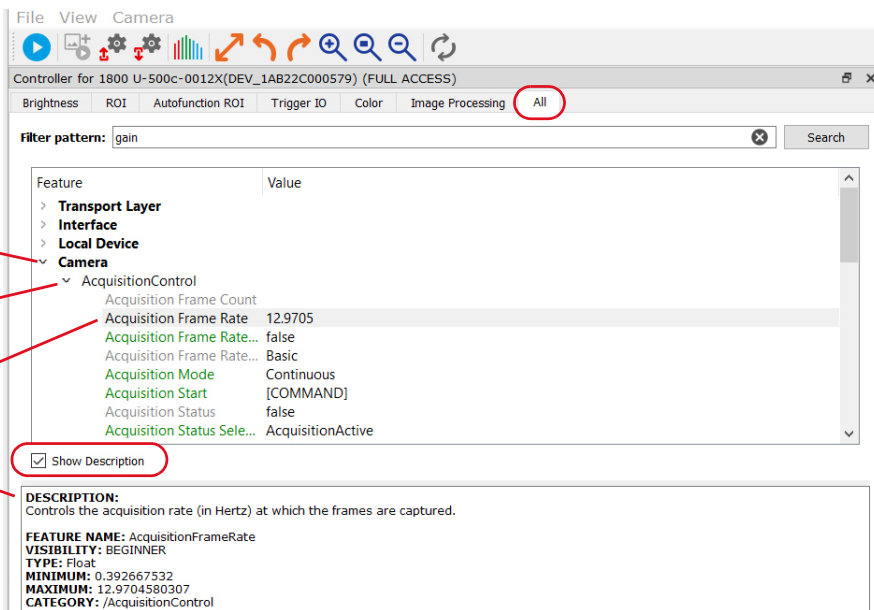
Categories and features in this reference are organized as in the **Vimba X Viewer**. Order and visibility can be different on third party viewers.

Previous Vimba Viewer only displayed some transport layer features. **With Vimba X Viewer**, all transport layer features are displayed. In the viewer's feature tree, the features are categorized by the corresponding GenTL module. The node **Camera** contains all camera features, while the nodes **Transport Layer**, **Interface**, **Local Device**, and **Stream 0** contain the transport layer features.

## Finding features

Camera firmware features can be found in the **Camera** GenTL Module of **Vimba X Viewer**. Transport layer features can be found in the other GenTL Modules. (These groups can differ when third party transport layers are used.) In this document, the included categories and features are listed in alphabetical order.

We recommend you to check **Show Descriptions in Vimba X Viewer** as shown in [Figure 1](#). The **All** tab is selected to show the feature tree. You can search for features using the search bar in **Vimba X Viewer**. You can easily search for features in this document using the [Index](#) on page 311.



The screenshot shows the Vimba X Viewer interface with the 'All' tab selected. The feature tree is expanded to show the 'Camera' module, which contains the 'AcquisitionControl' category. The 'Acquisition Frame Rate' feature is highlighted, and its description is displayed below the tree. Red arrows point to the 'GenTL Module', 'Category', 'Feature', and 'Description' labels on the left side of the image.

Feature	Value
Acquisition Frame Count	
Acquisition Frame Rate	12.9705
Acquisition Frame Rate...	false
Acquisition Frame Rate...	Basic
Acquisition Mode	Continuous
Acquisition Start	[COMMAND]
Acquisition Status	false
Acquisition Status Sele...	AcquisitionActive

**DESCRIPTION:**  
Controls the acquisition rate (in Hertz) at which the frames are captured.

**FEATURE NAME:** AcquisitionFrameRate  
**VISIBILITY:** BEGINNER  
**TYPE:** Float  
**MINIMUM:** 0.392667532  
**MAXIMUM:** 12.9704580307  
**CATEGORY:** /AcquisitionControl

Figure 1: Features listed in the All tab of Vimba X Viewer

## Differences in features and values

Features described in this document may not be supported by every Alvium model. Value ranges may differ between models as well.

**GenICam for CSI-2 Access** is supported for Alvium 1800 C models, please see the Alvium CSI-2 Cameras User Guide for details.

**ActionControl** features are supported only by Alvium GigE cameras.

**EventControl** features are supported only by Alvium GigE cameras. Therefore, **TestEventGenerate** in the **TestControl** category is available only for GigE as well.

**MultipleRegionControl** features are supported only by Alvium GigE and USB cameras with Sony IMX global shutter sensors.

**SequencerControl** features are supported only by Alvium GigE and USB cameras with Sony IMX global shutter sensors.

**TransferControl** features for image acquisition in burst mode are supported only by Alvium GigE cameras. Support for the other Alvium series is technically impossible.

## What else do you need?

This is a selection of helpful links:

Download or topic	Link
Alvium camera documentation and application notes	<a href="http://www.alliedvision.com/en/support/technical-documentation">www.alliedvision.com/en/support/technical-documentation</a>
<b>Vimba X SDK</b> for Windows, Linux, and Linux/ARM, including <b>Vimba X Viewer</b> , <b>Firmware Updater</b> , and <b>Driver Installer</b> for Windows	<a href="http://www.alliedvision.com/en/products/software/vimba-x-sdk">www.alliedvision.com/en/products/software/vimba-x-sdk</a>
Firmware downloads	<a href="http://www.alliedvision.com/en/support/firmware-downloads">www.alliedvision.com/en/support/firmware-downloads</a>
Technical support	<a href="http://www.alliedvision.com/en/support">www.alliedvision.com/en/support</a>

Table 1: Helpful links

# Contact us

## Website, email

### General

[www.alliedvision.com/en/contact](http://www.alliedvision.com/en/contact)  
[info@alliedvision.com](mailto:info@alliedvision.com)

### Distribution partners

[www.alliedvision.com/en/avt-locations/avt-distributors](http://www.alliedvision.com/en/avt-locations/avt-distributors)

### Support

[www.alliedvision.com/en/support](http://www.alliedvision.com/en/support)  
[www.alliedvision.com/en/about-us/contact-us/technical-support-repair-/-rma](http://www.alliedvision.com/en/about-us/contact-us/technical-support-repair-/-rma)

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# Document history and conventions



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# Document history

Version	Date	Document updates
V3.0.0	2023-Dec-05	<p><b>Firmware versions</b></p> <ul style="list-style-type: none"> <li>Alvium CSI-2: 00.13.00.849ffda0</li> <li>Alvium G1, G5/G5X, USB: 00.13.00.71d891fe</li> </ul> <p><b>Applied changes</b></p> <ul style="list-style-type: none"> <li>Added <b>ClockTriggerFrequency</b> and <b>ClockTriggerTimestamp</b> to <b>AcquisitionControl</b> on page 90.</li> <li>Removed <b>IntensityControllerOutliersBright</b> and <b>IntensityControllerOutliersDark</b> from <b>AutoModeControl</b> on page 117.</li> <li>Added <b>ChunkDataControl</b> on page 126.</li> <li>Added <b>DeviceTemperatureStatus</b> to <b>DeviceControl</b> on page 158.</li> <li><b>Beta:</b> Added <b>EventControl</b> on page 188.</li> <li>Added <b>Observe with binning features</b> on page 202 to improve usability.</li> <li>Added <b>LensShadingCorrection</b> on page 237.</li> <li>Added <b>LUTLoadAll</b> and <b>LUTSaveAll</b> to <b>LUTControl</b> on page 242.</li> <li>Changes in <b>SequencerControl</b> on page 253:           <ul style="list-style-type: none"> <li>Removed initial description and added a link to an application note for using sequencer features.</li> <li>Added <b>SequencerConfigurationReset</b></li> <li>Updated values for <b>SequencerFeatureSelector</b>, <b>SequencerSetLoad</b>, and <b>SequencerSetSave</b>.</li> </ul> </li> <li>Added <b>TestEventGenerate</b> to <b>TestControl</b> on page 264.</li> <li>Applied editorial changes.</li> </ul>
V2.9.2	2023-Jul-12	<p><b>Firmware version:</b> 00.12.00.00611a22</p> <p>Updated contents to include Alvium G5X cameras.</p>
V2.9.1	2023-Jun-16	<p><b>Firmware version:</b> 00.12.00.00611a22</p> <ul style="list-style-type: none"> <li>Updated graphic in <b>Image data flow</b> on page 30.</li> <li>Added GigE support for <b>TestPendingAck</b> in <b>TestControl</b> on page 264.</li> </ul>
V2.9.0	2023-Jun-07	<p><b>Release: Firmware version:</b> 00.12.00.00611a22</p> <ul style="list-style-type: none"> <li>Updated version for supported GigE Vision Standard from 1.2 to 2.2.</li> <li>Removed entry for document V2.7.1 in this list that stated the support of <b>TestPattern</b>. This information was wrong and still is. Therefore, this document never included descriptions for this feature.</li> </ul> <p>Continued on next page.</p>

Table 2: Document history (Sheet 1 of 6)

Version	Date	Document updates
V2.9.0	2023-May-24	<p><b>Release: Firmware version:</b> 00.12.00.00611a22</p> <p>Continued from previous page.</p> <ul style="list-style-type: none"> <li>Adjusted document structure to match Vimba X Viewer. This includes:           <ul style="list-style-type: none"> <li>Added information related to <a href="#">What else do you need?</a> on page 3.</li> <li>Added <a href="#">Feature descriptions: Transport Layer</a> on page 34.</li> <li>Added <a href="#">Feature descriptions: Interface</a> on page 54.</li> <li>Added <a href="#">Feature descriptions: Local Device</a> on page 76.</li> <li>Renamed previous “Feature descriptions” to <a href="#">Feature descriptions: Camera</a> on page 89.</li> <li>Added <a href="#">Feature descriptions: Stream 0</a> on page 284.</li> <li>Moved categories from previous “Feature descriptions” to new “Feature descriptions...” chapters.               <p><b>Note:</b> You can find categories and features in <a href="#">Contents</a> on page 5 and PDF bookmarks, or in <a href="#">Index</a> on page 311.</p> </li> <li>Removed contents about Config mode for IP settings.</li> <li>Updated diagrams in <a href="#">Notes on feature description</a> on page 29 for multiple regions.</li> </ul> </li> <li>Updated information in <a href="#">Differences in features and values</a> on page 3.</li> <li>Updated origin of feature for selected features in <a href="#">Feature descriptions: Camera</a> on page 89.</li> <li>Removed unit from <b>CounterDuration</b> in <a href="#">CounterAndTimerControl</a> on page 144.</li> <li>Changed interface support for <b>LineDebounceDuration</b> and <b>LineDebounceMode</b> in <a href="#">DigitalIOControl</a> on page 176.</li> <li>Added <b>SerialTxLock</b> to <a href="#">SerialHub (subcategory)</a> on page 182.</li> <li>Added <b>Sensor</b> option to <b>BinningSelector</b> in <a href="#">ImageFormatControl</a> on page 201.</li> <li>Added <a href="#">MultipleRegionControl (subcategory)</a> on page 213.</li> <li>Added LUTValueAll in <a href="#">LUTControl</a> on page 242.</li> <li>Removed <b>LUTEnable</b> from affected features and aligned the corresponding lists between <b>SequencerSelector</b> and <b>SequencerSetLoad</b> in <a href="#">SequencerControl</a> on page 253.</li> <li>Removed plural S for <b>StatFrame...</b> and <b>StatPacket...</b> features in <a href="#">Stream</a> on page 288 and <a href="#">StreamInformation</a> on page 306.</li> <li>Applied editorial changes.</li> </ul>

Table 2: Document history (Sheet 2 of 6)

Version	Date	Document updates
V2.8.1	2022-Nov-14	<b>Firmware version:</b> 00.11.00.9cf0c21e Updated the title image.
V2.8.0	2022-Oct-27	<b>Release: Firmware version:</b> 00.11.00.9cf0c21e <ul style="list-style-type: none"> <li>Updated standard references in <a href="#">Standards referred to in this document</a> on page 26.</li> <li>Updated <a href="#">Pseudo code example</a> on page 167 for <b>SequencerControl</b>.</li> <li>Updated options for <b>TriggerSource</b> in <a href="#">AcquisitionControl</a> on page 28, for <b>TimerTriggerSource</b> in <a href="#">CounterAndTimerControl</a> on page 75, for <b>LineSource</b> in <a href="#">DigitalIOControl</a> on page 106, and for <b>SequencerTriggerSource</b> in <a href="#">SequencerControl</a> on page 166.</li> <li>Added features support for <a href="#">ActionControl</a> on page 43 by Alvium G1 cameras.</li> <li>Added options for <b>DeviceTemperatureSelector</b> in <a href="#">DeviceControl</a> on page 89.</li> <li>Added Line Debounce features in <a href="#">DigitalIOControl</a> on page 106.</li> <li>Removed <b>ChunkDataControl</b> category.</li> <li>Added Counter features to <a href="#">CounterAndTimerControl</a> on page 75.</li> <li>Updated options for <a href="#">SoftwareSignalSelector</a> on page 178.</li> <li>Added <a href="#">TransferControl</a> on page 202 for burst image acquisition.</li> <li>Applied editorial changes.</li> </ul>
V2.7.2	2022-Jul-20	<b>Release: Firmware versions</b> <ul style="list-style-type: none"> <li>Alvium CSI-2, G5, USB: 00.10.6c9062b1</li> <li>Alvium G1: 00.10.00.2cf3b22e</li> </ul> <b>Applied change</b> Added notes that <b>ActionControl</b> features are not working properly on Alvium G1 cameras yet.

Table 2: Document history (Sheet 3 of 6)

Version	Date	Document updates
V2.7.1	2022-Jul-15	<p><b>Release: Firmware versions</b></p> <ul style="list-style-type: none"> <li>Alvium CSI-2, G5, USB: 00.10.6c9062b1</li> <li>Alvium G1: 00.10.00.2cf3b22e</li> </ul> <p><b>Applied changes</b></p> <ul style="list-style-type: none"> <li>Added options for <b>TriggerSource</b> in <a href="#">AcquisitionControl</a> on page 28.</li> <li>Added feature support for Alvium G5 in:               <ul style="list-style-type: none"> <li><a href="#">ActionControl</a> on page 43</li> <li><a href="#">GVCP (subcategory)</a> on page 128</li> <li><a href="#">PtpControl</a> on page 159.</li> </ul> </li> <li>Added feature support for Alvium USB cameras in <b>ChunkDataControl</b>.</li> <li>Added options for <b>TimerTriggerSource</b> in <a href="#">CounterAndTimerControl</a> on page 75.</li> <li>Added support for all Alvium cameras and reorganized features in <a href="#">SerialHub (subcategory)</a> on page 112.</li> <li>Added options to <b>FileSelector</b> in <a href="#">FileAccessControl</a> on page 117.</li> <li>Added TestPattern in <a href="#">ImageFormatControl</a> on page 134.</li> <li>Added features in <a href="#">SequencerControl</a> on page 166.</li> <li>Added features in <a href="#">SoftwareSignalControl</a> on page 177.</li> <li>Removed <b>ColorTransformationSelector</b> from <a href="#">ColorTransformationControl</a> on page 66.</li> </ul> <p>Applied editorial changes.</p>
V2.7.0	2022-Jun-09	<p><b>Release: Firmware versions</b></p> <ul style="list-style-type: none"> <li>Alvium CSI-2, G5,USB: 00.08.00.6727174b</li> <li>Alvium 1500 C-050, C-120, C-210, C-500, and 1800 C-500: 00.08.01.13f227a4</li> <li>Alvium G1: 00.09.00.45ce470f</li> </ul> <p><b>Applied changes</b></p> <ul style="list-style-type: none"> <li>Added support for Alvium G1 and G5 models.</li> <li>Added features in <a href="#">ActionControl</a> on page 43. (Currently available for <b>Alvium G1 only</b>)</li> <li>Added features in <a href="#">SerialHub (subcategory)</a> on page 112. (Currently available for <b>Alvium G1 only</b>)</li> <li>Added features in <a href="#">GVCP (subcategory)</a> on page 128. (Currently available for <b>Alvium G1 only</b>)</li> <li>Added features in <a href="#">PtpControl</a> on page 159. (Currently available for <b>Alvium G1 only</b>)</li> <li>Updated diagrams in <a href="#">AcquisitionControl</a> on page 28 for GigE cameras.</li> <li>Applied editorial changes.</li> </ul>
V2.6.1	2022-Mar-28	<p><b>Firmware version:</b> 00.08.00.6727174b</p> <p>Added <b>Timer0Active</b> and <b>Timer1Active</b> options for <b>LineSource</b>.</p>

Table 2: Document history (Sheet 4 of 6)

Version	Date	Document updates
V2.6.0	2022-Mar-21	<p><b>Release: Firmware version:</b> 00.08.00.6727174b</p> <ul style="list-style-type: none"> <li>Added support for selected Alvium 1800 C models.</li> <li>Updated diagrams in <a href="#">AcquisitionControl</a> on page 28 for convolution filters.</li> <li>Added the <b>CounterAndTimerControl</b> category.</li> <li>Added <b>AcquisitonFrameRateMode</b>, <b>ExposureActiveMode</b> and <b>SensorBitDepth</b>.</li> <li>Added features to control convolution filters in the <b>ImageProcessingControl</b> category.</li> <li>Added individual options <b>UserSet1</b> to <b>UserSet4</b> and descriptions to the <b>UserSetControl</b> category.</li> <li>Added features that are specific to MPI CSI-2, including the subcategories <b>StreamInformation/Statistics</b> and <b>TransportLayerControl/Info</b>.</li> <li>Applied editorial changes.</li> </ul>
V2.5.0	2021-Dec-07	<p><b>Release: Firmware version:</b> 00.07.00.81db3896</p> <ul style="list-style-type: none"> <li>Updated diagrams in <a href="#">AcquisitionControl</a> on page 28 for new LUT and Sharpness features.</li> <li>Added descriptions for <b>Sharpness</b>, <b>TriggerDelay</b>, and LUT features.</li> <li>Removed descriptions for <b>ContrastConfigurationMode</b>.</li> <li>Added information on using <b>ExposureMode</b>.</li> </ul>
V2.4.1	2021-Sep-22	<p><b>Release: Firmware version:</b> 00.06.00.35992</p> <p>Removed <b>FitRange</b> option from <b>IntensityControllerAlgorithm</b>.</p>
V2.4.0	2021-Aug-04	<p><b>Release: Firmware version:</b> 00.06.00.35992</p> <ul style="list-style-type: none"> <li>Updated <a href="#">Figure 2: Image data flow for Alvium cameras</a> on page 30.</li> <li>Added feature descriptions for <b>BinningHorizontal</b>, <b>BinningHorizontalMode</b>, <b>BinningSelector</b>, <b>BinningVertical</b>, <b>BinningVerticalMode</b>, and <b>DevicePowerSavingMode</b>.</li> <li>Applied editorial changes.</li> </ul>
V2.3.0.	2021-Apr-07	<p><b>Release: Firmware version:</b> 00.04.00.34658</p> <ul style="list-style-type: none"> <li>Added feature descriptions for <b>DeviceLinkCommandTimeout</b>, <b>DeviceTLVersionMajor</b>, <b>DeviceTLVersionMinor</b>, <b>TimestampLatch</b>, <b>TimestampLatchValue</b>, <b>TimestampReset</b>.</li> <li>Applied editorial changes.</li> </ul>
V2.2.0	2020-Nov-13	<p><b>Release: Firmware version:</b> 00.03.00.31919</p> <ul style="list-style-type: none"> <li>Added descriptions in <a href="#">AcquisitionControl</a> on page 28.</li> <li>Added <b>User</b> option to <b>CorrectionSet</b> and <b>CorrectionSetDefault</b> for defect pixel correction.</li> <li>Applied editorial changes.</li> </ul>

Table 2: Document history (Sheet 5 of 6)

Version	Date	Document updates
V2.1.2	2020-Jun-05	<b>Firmware version:</b> 00.01.02.28100 Corrected naming for the <b>IntensityAutoPrecedence</b> feature.
V2.1.1	2020-Mar-12	<b>Firmware version:</b> 00.01.02.28100 Removed notes for features previously enabled.
V2.1.0	2020-Feb-13	<b>Firmware version:</b> 00.01.02.28100 <ul style="list-style-type: none"> <li>Added contents for maximum values for contrast features.</li> <li>Added <b>ShutterMode</b> to the feature descriptions.</li> </ul>
V2.0.0	2020-Jan-07	<b>Release: Firmware version:</b> 00.01.02.28100 <ul style="list-style-type: none"> <li>Added descriptions for <b>Contrast, Gamma, Hue, Saturation</b> features, and <b>ExposureActive</b> option for <b>TriggerSelector</b>.</li> <li>Reorganized feature categories.</li> <li>Added information on related selectors.</li> <li>Reorganized introduction chapters.</li> <li>Corrected typographical errors.</li> </ul>
V1.0.3	2019-Sep-05	<b>Firmware version:</b> 00.01.00.26405 Applied editorial changes.
V1.0.2	2019-Jul-08	<b>Firmware version:</b> 00.01.00.26405 Applied editorial changes.
V1.0.1	2019-Jul-05	<b>Firmware version:</b> 00.01.00.26405 Applied editorial changes.
V1.0.0	2019-Jul-01	<b>Firmware version:</b> 00.01.00.26405 Associated firmware version: 00.01.00.26405 Release version

Table 2: Document history (Sheet 6 of 6)

## Conventions used in this document

To give this document an easily understandable layout and to emphasize important information, the following typographical styles and symbols are used:

### Styles

Style (example)	Function
<b>Emphasis</b>	Some important parts or items of the text are emphasized to make them more visible.
Features names	Features names are displayed as monospaced text.
<i>Features options</i>	Features options and values that are selectable by the user are displayed as monospaced italicized text.

Table 3: Styles used in this reference (Sheet 1 of 2)



Style (example)	Function
<i>Non-standard features options</i>	Marked with superscript ( <sup>1</sup> ) are features that complement the features defined in the SFNC.
<i>InputCommand</i>	Text or command to type in by the user, selected menu options, or other selectable options.
SourceCode	Code words, such as for programs, used in running text. Mainly designated for use in software documentation.
<b>UIElement</b>	Text that is displayed, or output, by the system for the user, like parts of the GUI, dialog boxes, buttons, menus, important information, or windows titles.
WebReference	References to other documents or webpages, like weblinks, hypertext links, or emails.

Table 3: Styles used in this reference (Sheet 2 of 2)

## Symbols and notes



### Practical tip

Additional information helps to understand or ease handling the camera.



### Additional information

Web address or reference to an external source with more information is shown.



### Avoiding malfunctions

Precautions are described.

## Access

Acronym	Meaning
R/W	Feature is read/write.
R/(W)	Feature is readable, and 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.
ROI	Region of interest
W	Feature is write-only.

Table 4: Abbreviations used in this reference

## Standards referred to in this document

The document describes in alphabetical order the basic and advanced camera controls for Allied Vision Alvium cameras as seen from Vimba Viewer.

These features comply with the following standards:

- GigE Vision Standard Version 2.2
- USB3 Vision Standard Version 1.1
- GenICam Standard Document Version 2.1.1
- GenICam Standard Features Naming Convention (SFNC) Version 2.7
- GenICam Pixel Format Naming Convention (PFNC) Version 2.2
- GenICam Transport Layer Standard Features Naming Convention (GenTL SFNC)
  - CSI-2: Version 1.2.0
  - GigE: Version 1.1.1
  - USB: Version 1.0.0
- GenICam Generic Control Protocol (GenCP) Version 1.3



### Downloads of applied common standards

For SFNC, GenTL SFNC, and GenCP, see [www.genicam.org](http://www.genicam.org)

For USB3 Vision and PFNC, see [www.visiononline.org](http://www.visiononline.org)



### Allied Vision custom features

Some features in this document are adapted SFNC features. Some features are custom features adding new functions to the features range defined by the SFNC. See [Acronyms and terms](#) on page 26.

## Acronyms and terms

Abbreviation/term	Meaning
Custom	Non-SFNC features that are adding to new functions to the existing SFNC feature definitions
GenTL SFNC	GenICam Transport Layer Standard Features Naming Convention
GenTL SFNC adapted	Features that deviate from the GenTL SFNC definition
GEV	GigE Vision Standard
SFNC	GenICam Standard Features Naming Convention
SFNC adapted	Features that deviate from the SFNC definition
Timestamp	For Alvium cameras, the timestamp interval is 1 Tick = 1 Nanosecond.  This information is used for features in <a href="#">EventControl</a> on page 188.
U3V	USB3 Vision Standard

Table 5: Standards used in this reference

## Description scheme

This document is organized from GenTL Modules down to categories and features, in alphabetical order. For the structure in **Vimba X Viewer**, see [Finding features](#) on page 2.

The features in this reference are described according to the following formatting scheme.

### Category name

First-level item, always starting a new page. Short description of category, including individual characteristics, and showing the Feature type as (*Category*).

### Subcategory

Second-level item. Short description of subcategory, including individual characteristics, and showing the Feature type as (*Category*).

### Feature

[Selector]

Second-level or third-level item. Short description of feature, including individual characteristics and possible values, and showing the full Category path.

## Features availability

Some features are available for one camera interface only. Other features differ between camera interfaces. **AcquisitionFrameCount** is supported for all interfaces. If a feature is supported for some interfaces only, the **Interface support** is stated.

### AcquisitionFrameCount

Controls the number of frames to acquire in *MultiFrame* acquisition mode.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Frame Count
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	(number)
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

## Selectors

Some features have multiple instances. For these features, Selector features define which instance of the feature is accessed.

Example: the `LineInverter` feature, used to invert internal signal polarity, can be applied to all input and output lines of the camera. The line is selected by the `LineSelector` feature.

The headline for the feature description is `LineInverter[LineSelector]`, according to the C programming language convention for arrays: a pair of brackets follows the feature name, like in `SelectedFeature[Selector]`.

## Invalidators

Some features have opposing functions. For example, `Sharpness` enhances edge contrast while `Blur` reduces edge contrast. Therefore, when `Sharpness` is enabled, `Blur` is automatically disabled. Feature descriptions provide an additional row for opposing features, called **Affected features**.

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# Notes on feature description



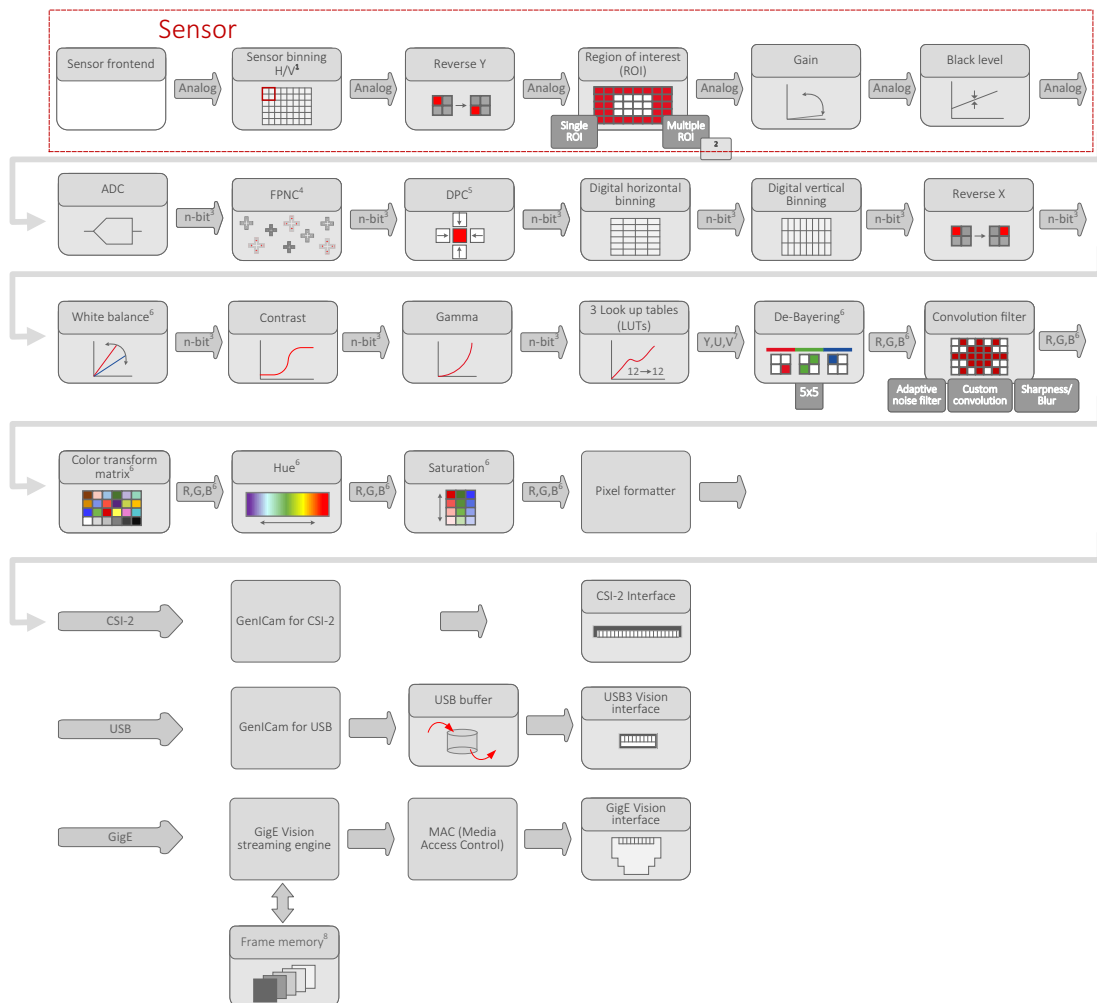
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# Image data flow

To develop your application effectively, note the order in which the features are processed in Alvim cameras.

In the Alvim user guides, the image data flow describes the sequence of image processing steps inside the camera. The shown functionalities represent features or feature groups.



<sup>1</sup> Selected monochrome models only: See your Alvim camera's user guide.

<sup>2</sup> Selected models only: See your Alvim camera's user guide.

<sup>3</sup> Model dependent: See ADC bit depths stated in your Alvim camera's user guide.

<sup>4</sup> Factory preset for FPNC = Fixed Pattern Noise Correction. For model availability, see your Alvim camera's user guide.

<sup>5</sup> Factory preset for DPC = Defect pixel correction

<sup>6</sup> Color models only

<sup>7</sup> For monochrome models: Y only

<sup>8</sup> Referred to as **Image buffer** in the feature descriptions.

Figure 2: Image data flow for Alvim cameras

## Feature interdependencies

The conversion between time and clock cycles affects control values. Features for pixel format, bandwidth, ROI, exposure time, and triggering are related to each other. Changing values for one feature can change values for another feature. For example, frame rates can be reduced when `PixelFormat` is changed subsequently. [Figure 3](#) shows the interdependencies.

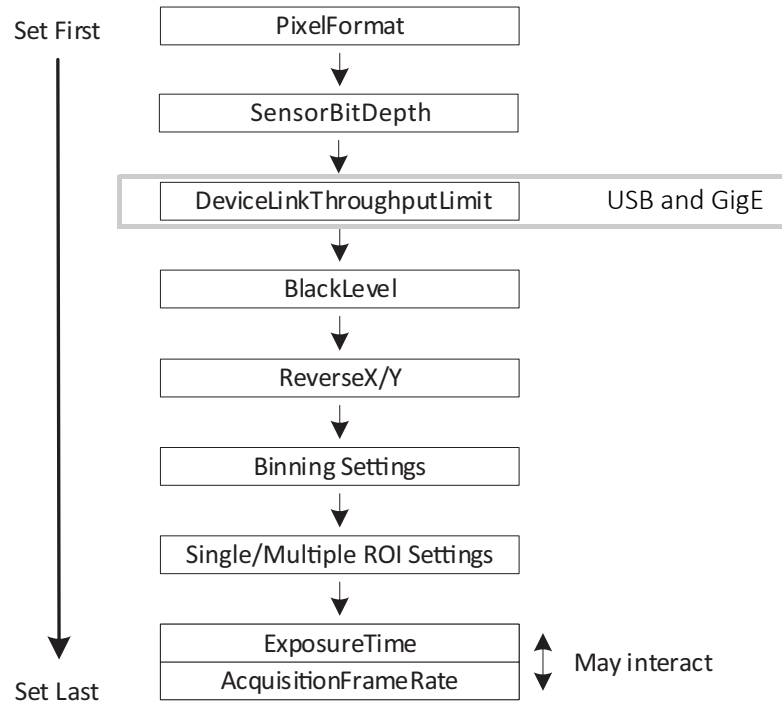


Figure 3: Interdependencies between features

# Regions of interest and auto mode regions



## Multiple regions

See descriptions in [MultipleRegionControl \(subcategory\)](#) on page 213.

Generally, auto mode regions are areas or regions on the image, where measurements are done to be used by various auto-features, for example measurement of the intensity for auto-exposure control.

The features used to define area of regions of interest (ROIs) and auto mode regions are displayed in Figure 4.

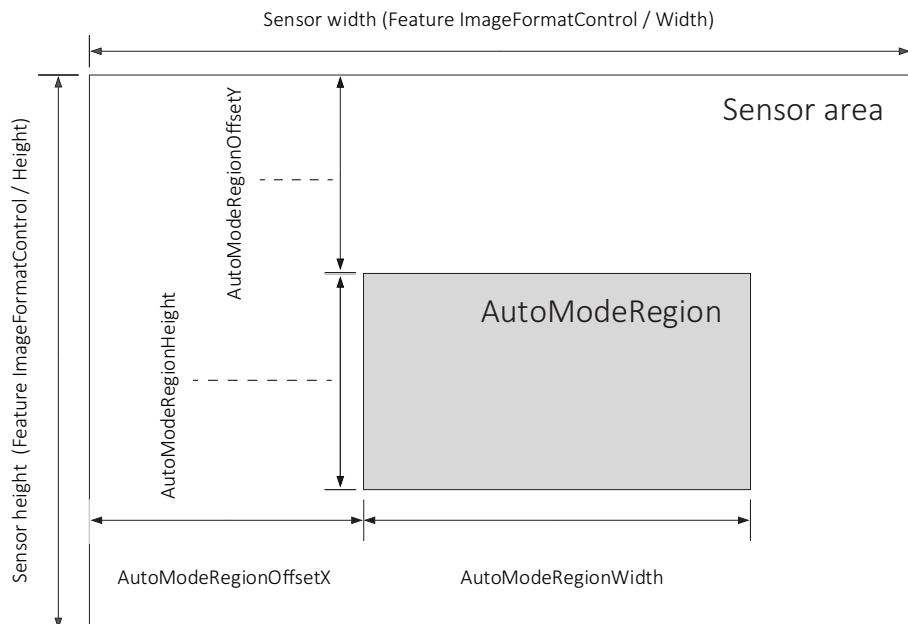


Figure 4: auto mode region and ROI measurement features

It is possible to have multiple auto mode regions. Also, multiple sensor-ROIs are supported that are called DisplayROI in this document. A DisplayROI covers the area that is being transmitted by the camera subsystem.

The interaction of auto mode regions and ROIs would allow for a huge variety of possibilities. However, the actual interaction is limited to a few useful possibilities that practically make sense.

## Basic rules

- Auto mode regions must be explicitly enabled by a feature.
- One auto mode region inside a ROI is permitted. This provides a fixed correlation between ROI and auto mode region.



- Auto mode region and ROI coordinates are absolute to the sensor area. If the ROI position is changed, the position of the auto mode region is maintained. The auto mode region represents the content changed by shifting the ROI.
- The auto mode region must be inside the respective ROI.
- If auto mode regions are enabled, the position and size are set to the same position and size of the respective ROI. This means that disabling and re-enabling the auto mode regions resets their positions and sizes.
- If ROI is changed, auto mode region may need to be adjusted. To do so, **set the position before you set the size.**

Therefore, as long as the origin of the auto mode region remains inside the ROI, the position and size of the auto mode region can be maintained.

To ensure no part of the auto mode region is outside the ROI, the size of the auto mode region is adjusted until the minimum allowed size is reached.

Only then the position may be altered.

## ROI and auto mode region effects

Auto mode region is always treated as a subset of ROI. The following scenarios show the interaction between ROI and auto mode region and gives recommendations where auto mode region settings can be improved. Vice versa, you can adjust settings for ROI to match an existing auto mode region.

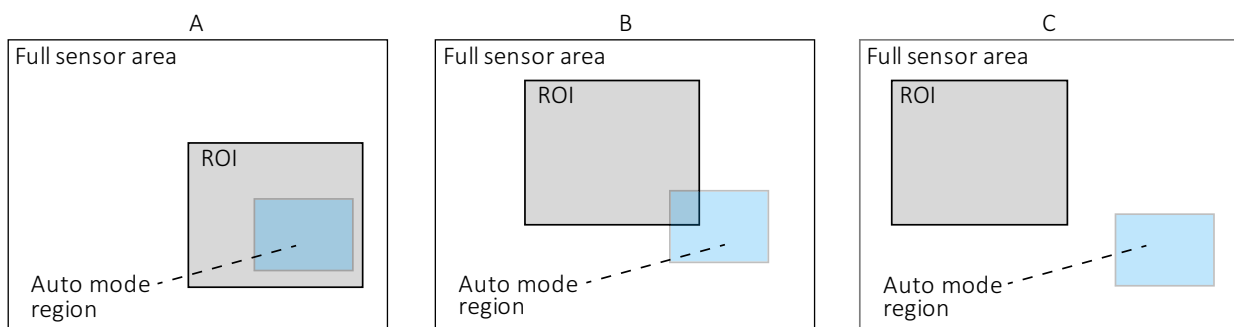


Figure 5: ROI and auto mode region effects

- Scenario:** User input creates an auto mode region included by a larger ROI.  
**Result:** Camera logic applies no changes to the selected auto mode region. The complete auto mode region is effective.
- Scenario:** User input creates a common area between ROI and auto mode region is only small.  
**Result:** Camera logic reduces the effective auto mode region to the common area between auto mode region and ROI.  
**Recommendation:** Relocate and resize auto mode region to become a subset of or to match ROI.
- Scenario:** User input creates ROI and auto mode region that have no common area.  
**Result:** Camera logic reduces the effective auto mode region to  $\emptyset$ .  
**Recommendation:** Relocate and resize auto mode region to become a subset or to match ROI.

# Feature descriptions: Transport Layer



This chapter includes:

ActionControl .....	35
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InterfaceEnumeration .....	50

## ActionControl

The features in this category can be used to send (scheduled) action commands to GigE cameras.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Control
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## ActionCommand

Sends an action command.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Command
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

## ActionDeviceKey

Controls the device key for an action command to be sent.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Device Key
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

## ActionGroupKey

Controls the group key for an action command to be sent.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Key
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl
Values	Description
0	Minimum
4294967295	Maximum

## ActionGroupMask

Controls the group mask for an action command to be sent.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Mask
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl
Values	Description
0	Minimum
4294967295	Maximum

## ActionScheduledTime

Controls the time in a time-enabled action command.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Scheduled Time
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
<i>0</i>	Minimum
<i>9223372036854775807</i>	Maximum

## ActionScheduledTimeEnable

Enables or disables time-enabled action commands.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Scheduled Time Enable
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
<i>True</i>	Scheduled action command are enabled.
<i>False</i>	Scheduled action commands are disabled (default).

## GevActionDestinationIPAddress

Controls the IP address for an action command to be sent.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Action Destination IP Address
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionCode

Values	Description
0	Minimum
4294967295	Maximum

## SystemInformation

The features in this category can be used to display versions of the used GenTL and GenTL SFNC, and to identify the GenTL Producer.

<b>Interface support</b>	All
<b>Display name</b>	System Information
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## GenTL SFNC Version Major

Displays the major version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

<b>Interface support</b>	USB
<b>Display name</b>	Gen TL SFNC Version Major
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum

### GenTL SFNC Version Minor

Displays the minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

<b>Interface support</b>	USB
<b>Display name</b>	Gen TL SFNC Version Minor
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum

### GenTL SFNC Version Sub Minor

Displays the sub minor version number of the GenTL Standard Features Naming Convention that was used to create the GenTL Producer's XML.

<b>Interface support</b>	USB
<b>Display name</b>	Gen TL SFNC Version Sub Minor
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
-9223372036854775808	Minimum
9223372036854775807	Maximum



## GenTLVersionMajor

Displays the major version number of the GenTL specification the GenTL Producer implementation complies with.

<b>Interface support</b>	All
<b>Display name</b>	Gen TL Version Major
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
0	Minimum
4294967295	Maximum

## GenTLVersionMinor

Displays the minor version number of the GenTL specification the GenTL Producer implementation complies with.

<b>Interface support</b>	All
<b>Display name</b>	Gen TL Version Minor
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
0	Minimum
4294967295	Maximum

## GevVersionMajorNumber

Displays the major version number of the GigE Vision specification the GenTL Producer implementation complies to.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Version Major Number
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
<i>-9223372036854775808</i>	Minimum
<i>9223372036854775807</i>	Maximum

## GevVersionMinorNumber

Displays the minor version number of the GigE Vision specification the GenTL Producer implementation complies to.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Version Minor Number
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
<i>-9223372036854775808</i>	Minimum
<i>9223372036854775807</i>	Maximum

## TLDisplayName

Displays the user readable name of the GenTL Producer.

This features corresponds to the TL\_INFO\_DISPLAYNAME command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Display Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## TLID

Displays the Unique identifier of the GenTL Producer like a GUID.

This feature corresponds to the TL\_INFO\_ID command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL ID
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## TLModelName

Displays the name of the GenTL Producer to distinguish different kinds of GenTL Producer implementations from one vendor.

This feature corresponds to the TL\_INFO\_MODEL command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Model Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## TLPath

Displays the full path to the GenTL Producer driver including name and extension.

This feature corresponds to the TL\_INFO\_PATHNAME command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Path
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## TLType

Displays the transport layer type of the GenTL Producer implementation.

Corresponds to the TL\_INFO\_TLTYPE command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Type
<b>Standard</b>	Gen TL SFNC adapted
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	Enumeration
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

Values	Description
<i>Custom</i>	MIPI CSI-2
<i>GigEVision</i>	GigE Vision
<i>USB3Vision</i>	USB3 Vision

## TLVendorName

Displays the name of the GenTL Producer vendor.

This feature corresponds to the TL\_INFO\_VENDOR command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Vendor Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## TLVersion

Displays the vendor specific version string.

This feature corresponds to the TL\_INFO\_VERSION command of TLGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	TL Version
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SystemInformation

## CameraAddressForcing

This category contains system features to force access for cameras that are otherwise not detected.

<b>Interface support</b>	GigE
<b>Display name</b>	Camera Address Forcing
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## GevDeviceForceGateway

Controls the gateway of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force Gateway
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CameraAddressForcing

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceForceIP

Sends the force address command on all interfaces.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force IP
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CameraAddressForcing

## GevDeviceForceIPAddress

Controls the IP address of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force IP Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CameraAddressForcing

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceForceMACAddress

Controls the 48-Bit MAC address of the GEV camera to force the IP setup.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force MAC Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CameraAddressForcing

Values	Description
0	Minimum
9223372036854775807	Maximum



## GevDeviceForceSubnetMask

Controls the subnet mask of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force Subnet Mask
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CameraAddressForcing

Values	Description
0	Minimum
4294967295	Maximum

## InterfaceEnumeration

The features in this category can be used for interface enumeration of the system module.

<b>Interface support</b>	All
<b>Display name</b>	Interface Enumeration
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## InterfaceCount

Displays the number of interfaces on the corresponding GenTL Producer.

<b>Interface support</b>	All
<b>Display name</b>	Interface Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

## InterfaceDisplayName

[InterfaceSelector]

Displays the user readable name of the selected interface.

<b>Interface support</b>	All
<b>Display name</b>	Interface Display Name
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

## InterfaceID

[InterfaceSelector]

Displays the GenTL Producer wide unique identifier of the selected interface.

<b>Interface support</b>	All
<b>Display name</b>	Interface ID
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

## GevInterfaceIPAddress

[InterfaceSelector]

Displays the IP address of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface IP Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

Values	Description
0	Minimum
4294967295	Maximum

## GevInterfaceIPSubnetMask

[InterfaceSelector]

Displays the subnet mask of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface IP Subnet Mask
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

Values	Description
0	Minimum
4294967295	Maximum

## GevInterfaceMACAddress

[InterfaceSelector]

Displays the 48-Bit MAC of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface IP Subnet Mask
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

Values	Description
0	Minimum
9223372036854775807	Maximum

## InterfaceSelector

Selects the GenTL Producer interface.

<b>Interface support</b>	All
<b>Display name</b>	Interface Selector
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration
<b>Values</b>	<b>Description</b>
$\geq 0$	Value range

## InterfaceUpdateList

Updates the interface list on this GenTL Producer.

<b>Interface support</b>	All
<b>Display name</b>	Interface Update List
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

# Feature descriptions: Interface



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## ActionControl

This category contains all Action Control features of the **Interface module**.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Control
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## ActionCommand

Creates an action command.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Command
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

## ActionDeviceKey

Creates the Action Command Device Key to use in the action command.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Device Key
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	ActionControl

Values	Description
0	Minimum
4294967295	Maximum

## ActionGroupKey

Creates the Action Command Group Key to use in the action command.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Key
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl
Values	Description
0	Minimum
4294967295	Maximum

## ActionGroupMask

Creates the Action Command Group Mask to use in the action command.

**Note:** This parameter must have the same value for all devices in a group.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Mask
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl
Values	Description
0	Minimum
4294967295	Maximum



## ActionScheduledTime

Controls the time for a time-enabled action command.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Scheduled Time
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
9223372036854775807	Maximum

## ActionScheduledTimeEnable

Enables or disables time-enabled action commands.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Scheduled Time Enable
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
9223372036854775807	Maximum

## GevActionDestinationIPAddress

Controls the destination IP address for the action command.

**Note:** This can be any valid destination address (including broadcast addresses for this interface).

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Action Destination IP Address
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

## DeviceEnumeration

This category contains all Device Enumeration features of the **Interface module**.

<b>Interface support</b>	All
<b>Display name</b>	Device Enumeration
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## DeviceAccessStatus

Displays the device's access status at the moment of the last execution of DeviceUpdateList.

<b>Interface support</b>	All
<b>Display name</b>	Device Access Status
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

<b>Values</b>	<b>Description</b>
<i>Unknown</i>	Producer is unknown.
<i>ReadWrite</i>	Full access
<i>ReadOnly</i>	Read-only access
<i>No access</i>	No connection available
<i>Busy</i>	The device has been opened by another entity already.
<i>OpenReadWrite</i>	The device has been opened in Read/Write mode by this GenTL host.
<i>OpenreadOnly</i>	The device has been opened in Read only mode by this GenTL host.

## DeviceCount

Displays the number of found devices

<b>Interface support</b>	All
<b>Display name</b>	Device Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

Values	Description
0	Minimum
4294967295	Maximum

## DeviceDisplayName

[DeviceSelector]

Displays the user readable name of the selected device.

<b>Interface support</b>	All
<b>Display name</b>	Device Display Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceDriverPath

[DeviceSelector]

Displays the system driver path that can be used for opening the selected device.

<b>Interface support</b>	USB
<b>Display name</b>	Device Driver Path
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceID

[DeviceSelector]

Displays the interface wide unique identifier of the selected device.

<b>Interface support</b>	All
<b>Display name</b>	Device ID
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceLocation

[DeviceSelector]

Displays the location path of the device in the tree of the corresponding interface that can be used for opening the selected device.

<b>Interface support</b>	USB
<b>Display name</b>	Device Location
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceModelName

[DeviceSelector]

Displays the name of the selected device model.

This feature corresponds to **DeviceModelName** of the remote device.

<b>Interface support</b>	All
<b>Display name</b>	Device Model Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceSelector

Selects the device to be displayed.

<b>Interface support</b>	All
<b>Display name</b>	Device Selector
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration
Values	Description
$\geq 0$	Value range

## DeviceType

[DeviceSelector]

Displays the transport layer technology of the selected device.

<b>Interface support</b>	All
<b>Display name</b>	Device Type
<b>Standard</b>	Gen TL SFNC adapted
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration
Values	Description
<i>Custom</i>	MIPI CSI-2
<i>GigEVision</i>	GigE Vision
<i>USB3</i>	USB3 Vision

## DeviceUpdateList

Updates the transport layer's device list.

<b>Interface support</b>	All
<b>Display name</b>	Device Update List
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration

## DeviceVendorName

[DeviceSelector]

Displays the vendor's name for the selected device.

This feature corresponds to the **DeviceVendorName** of the remote device.

<b>Interface support</b>	All
<b>Display name</b>	Device Vendor Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration



## Gev

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

This category contains GigE related features for Device Enumeration.

<b>Interface support</b>	GigE
<b>Display name</b>	GVCP
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/DeviceEnumeration

## GevDeviceForceGateway

Controls the gateway of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force Gateway
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceForceIP

Sends the force address command on all interfaces.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force IP
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

## GevDeviceForceIPAddress

Controls the IP address of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force IP Address
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceForceSubnetMask

Controls the subnet mask of the GEV camera to be forced.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Device Force Subnet Mask
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceIPAddress

[DeviceSelector]

Displays the current IP address of the selected remote device.

<b>Interface support</b>	GigE
<b>Display name</b>	Device IP Address
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevDeviceMACAddress

[DeviceSelector]

Displays the current 48-Bit MAC address of the selected remote device.

<b>Interface support</b>	GigE
<b>Display name</b>	Device MAC Address
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
9223372036854775807	Maximum

## GevDeviceSubnetMask

[DeviceSelector]

Displays the current IP address of the selected remote device.

<b>Interface support</b>	GigE
<b>Display name</b>	Device Subnet Mask
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevInterfaceIPAddress

[DeviceSelector]

Displays the IP address of the selected subnet of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface IP Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
4294967295	Maximum

## GevInterfaceMACAddress

Displays the current 48-Bit MAC address of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface MAC Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev

Values	Description
0	Minimum
9223372036854775807	Maximum

## GevInterfaceSubnetMask

[DeviceSelector]

Displays the current IP address of the selected subnet of the interface.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface Subnet Mask
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceEnumeration/Gev
Values	Description
0	Minimum
4294967295	Maximum

## Settings

The features in this category can be used to specify settings for GigE Device Discovery.

<b>Interface support</b>	GigE
<b>Display name</b>	Settings
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

### DevicesDiscoveryBroadcastMode

Selects the area where the interface (= the host) sends DHCP discover messages.

<b>Interface support</b>	GigE
<b>Display name</b>	Discovery Broadcast Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Settings

Values	Description
<i>Local</i>	The interface sends the discovery broadcast to the local broadcast IP address 255.255.255.255 (default).
<i>Subnet</i>	The interface sends the discovery broadcast to a subnet broadcast IP address, such as 192.168.1.255.

## DevicesDiscoveryMode

Controls how the interface discovers connected devices, using GigE Vision discover messages.

<b>Interface support</b>	GigE
<b>Display name</b>	Devices Discovery Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Settings

Values	Description
<i>Auto</i>	The interface sends the GigE Vision discover message in a frequency [ms]: $\text{InterfaceBeatRate} \times \text{InterfaceHailPace}$ (Default)
<i>Once</i>	The interface sends the GigE Vision discover message once during the startup of the transport layer.
<i>Off</i>	The interface does not send GigE Vision discover messages.

## InterfaceBeatRate

Controls the frequency for the interface to send DHCP discover messages.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface Beat Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	ms (milliseconds)
<b>Affected features</b>	Not applicable
<b>Category</b>	/Settings

Values	Description
<i>10</i>	Minimum
<i>500</i>	Default value
<i>10000</i>	Maximum



## InterfaceHailPace

Controls the frequency for the interface to “hail” (page) devices.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface Hail Pace
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Settings

Values	Description
1	Value of <code>InterfaceBeatRate</code>
4	Default value
10	10 × value of <code>InterfaceBeatRate</code>

## InterfacePingPace

Controls the frequency for the interface to ping devices.

<b>Interface support</b>	GigE
<b>Display name</b>	Interface Ping Pace
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Settings

Values	Description
1	Value of <code>InterfaceBeatRate</code>
2	Default value
10	10 × value of <code>InterfaceBeatRate</code>

## InterfaceInformation

This category contains all Interface Information features of the **Interface module**.

<b>Interface support</b>	All
<b>Display name</b>	Interface Information
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## InterfaceDisplayName

[InterfaceSelector]

Displays the user readable name of the selected interface.

This feature corresponds to the INTERFACE\_INFO\_DISPLAYNAME command of IFGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	Interface Display Name
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceInformation

## InterfaceID

[InterfaceSelector]

Displays the GenTL Producer wide unique identifier of the selected interface.

This feature corresponds to the INTERFACE\_INFO\_ID command of IFGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	Interface ID
<b>Standard</b>	Gen TL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceInformation

## InterfaceType

Displays the transport layer type of the interface.

This feature corresponds to the INTERFACE\_INFO\_TLTYPE command of IFGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	Interface Type
<b>Standard</b>	Gen TL SFNC adapted
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceInformation

<b>Values</b>	<b>Description</b>
<i>Custum</i>	MIPI CSI-2
<i>GigEVision</i>	GigE Vision
<i>USB3</i>	USB3 Vision

# Feature descriptions: Local Device



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## DeviceInformation

Features in this category provide basic information about the **Device module** and its identity.

<b>Interface support</b>	All
<b>Display name</b>	Device Information
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## DeviceDisplayName

Displays the user readable name of the camera.

This feature corresponds to the `DEVICE_INFO_DISPLAYNAME` command of `DevGetInfo` function.

<b>Interface support</b>	All
<b>Display name</b>	Device Display Name
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

## Gev

**Note:** Features in this subcategory are **available for Alvium GigE cameras only.**

The features in this subcategory can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

<b>Interface support</b>	GigE
<b>Display name</b>	GigE
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	(Category)
<b>Category</b>	/DeviceInformation

## DeviceEndiannessMechanism

Displays the Endianness mode.

<b>Interface support</b>	GigE
<b>Display name</b>	Device Endianness Mechanism
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation/Gev

Values	Description
<i>Legacy</i>	Device endianness is handled according to GenICam Schema 1.0 (default).
<i>Standard</i>	Device endianness is handled according to GenICam Schema 1.1 and later.

## GevDeviceGateway

Displays the current gateway of the GVCP interface of the selected remote device (camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Device Gateway
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation/Gev
<b>Values</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## GevDeviceIPAddress

Displays the current IP address of the GVCP interface of the remote device (camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Device IP Address
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation/Gev
<b>Values</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## GevDeviceMACAddress

Displays the current 48-Bit MAC address of the GVCP interface of the remote device (camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Device MAC Address
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation/Gev

Values	Description
0	Minimum
9223372036854775807	Maximum

## GevDeviceSubnetMask

Displays the current subnet of the GVCP interface of the remote device (camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Device Subnet Mask
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation/Gev

Values	Description
0	Minimum
4294967295	Maximum



## DeviceInformation (category continued)

The feature descriptions for the `/DeviceInformation/Dev` category have ended on the previous page. The following features continue the `/DeviceInformation` category, without a subcategory.

### DeviceID

Displays the interface-wide unique identifier of this device.

This feature corresponds to the `DEVICE_INFO_ID` command of `DevGetInfo` function.

<b>Interface support</b>	All
<b>Display name</b>	Device ID
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

### DeviceLocation

Displays the location path of the device in the tree of the corresponding interface that can also be used for opening the device (camera).

<b>Interface support</b>	USB
<b>Display name</b>	Device Location
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

## DeviceModelName

Displays the name of the camera model.

Corresponds to the DEVICE\_INFO\_MODEL command of DevGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	Device Model Name
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

## DeviceType

Displays the transport layer type of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Type
<b>Standard</b>	GenTL SFNC adapted
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

Values	Description
<i>Custom</i>	MIPI CSI-2
<i>GigEVision</i>	GigE Vision
<i>USB3</i>	USB3 Vision

## DeviceVendorName

Displays the name of the camera vendor.

This feature corresponds to the DEVICE\_INFO\_VENDOR command of DevGetInfo function.

<b>Interface support</b>	All
<b>Display name</b>	Device Vendor Name
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

## DriverPath

Displays the system driver path that can also be used for opening the camera.

<b>Interface support</b>	USB
<b>Display name</b>	Driver Path
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceInformation

## GigE

**Note:** Features in this category are **available for Alvium GigE cameras only**.

The features in this category can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

<b>Interface support</b>	GigE
<b>Display name</b>	GigE
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## GVCP

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

The features in this subcategory can be used to control command traffic and timings between the host and the camera.

<b>Interface support</b>	GigE
<b>Display name</b>	GVCP
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/GigE

## GVCPCmdRetries

Controls the number of times a particular command to the camera is resent when no answer is being received.

<b>Interface support</b>	GigE
<b>Display name</b>	Command Retries
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	GevHeartbeatTimeout, GevHeartbeatInterval, GVCPhBInterval
<b>Category</b>	/GigE/GVCP

Values	Description
1	Minimum
9	Maximum

## GVCPCmdTimeout

Controls the period of time for the host to wait for an answer from the camera.

<b>Interface support</b>	GigE
<b>Display name</b>	Command Timeout
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	ms (milliseconds)
<b>Affected features</b>	GevHeartbeatTimeout, GevHeartbeatInterval, GVCPhBInterval
<b>Category</b>	/GigE/GVCP

Values	Description
100	Minimum
10000	Maximum

## GevHeartbeatInterval

Controls the period of time after which a heartbeat is sent by the host.

<b>Interface support</b>	GigE
<b>Display name</b>	Heartbeat Interval
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	ms (milliseconds)
<b>Affected features</b>	GVCPHBInterval
<b>Category</b>	/GigE/GVCP

Values	Description
200	Minimum
200	Maximum

## GevHeartbeatTimeout

Controls the period of time after which the camera rejects control by the host if no heartbeat activity is registered.

<b>Interface support</b>	GigE
<b>Display name</b>	Heartbeat Timeout
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	ms (milliseconds)
<b>Affected features</b>	GevHeartbeatInterval, GVCPHBInterval
<b>Category</b>	/GigE/GVCP

Values	Description
25100	Minimum
100000	Maximum

## StreamEnumeration

This category contains all Stream Enumeration features of the **Device module**.

<b>Interface support</b>	All
<b>Display name</b>	Stream Enumeration
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## StreamCount

Displays the number of available streams.

<b>Interface support</b>	All
<b>Display name</b>	Stream Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamEnumeration

Values	Description
0	Minimum
4294967295	Maximum

## StreamID

[StreamSelector]

Displays the unique identifier for the stream of the selected device (camera), for instance a GUID.

<b>Interface support</b>	All
<b>Display name</b>	Stream ID
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamEnumeration

## StreamSelector

Selects the stream channel.

<b>Interface support</b>	All
<b>Display name</b>	Stream Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/InterfaceEnumeration

Values	Description
$\geq 0$	Value range



# Feature descriptions: Camera



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## AcquisitionControl

The features in this category can be used to control acquisition, frame rate, and exposure time, and to enable triggering the camera and connected devices, such as strobe lights.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## AcquisitionFrameCount

Controls the number of frames to acquire in *MultiFrame* acquisition mode.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Frame Count
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	(number)
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

## AcquisitionFrameRate

Controls the acquisition rate at which the frames are captured.

### Notes

- If `AcquisitionFrameRateEnable` is false, `AcquisitionFrameRate` is read-only.
- If values for exposure time or ROI are changed **after** `AcquisitionFrameRate` has been set, the value may be adjusted. See [Feature interdependencies](#) on page 31. In this case the value for `AcquisitionFrameRate` must be re-adjusted by the user.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Frame Rate
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Hertz
<b>Affected features</b>	ExposureTime
<b>Category</b>	/AcquisitionControl

## AcquisitionFrameRateEnable

Enables or disables `AcquisitionFrameRate`.

**Note:** Otherwise, the frame rate is implicitly controlled by the combination of other features like `ExposureTime`.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Frame Rate Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate
<b>Category</b>	/AcquisitionControl

Values	Description
<i>True</i>	<code>AcquisitionFrameRate</code> feature is writable and used to control the acquisition rate.
<i>False</i>	<code>AcquisitionFrameRate</code> is implicitly controlled by the combination of other features like <code>ExposureTime</code> . Automatically, the maximum available frame rate is used.

## AcquisitionFrameRateMode

Selects the priority between `AcquisitionFrameRate` and `ExposureTime`.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Frame Rate Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not affected
<b>Category</b>	/AcquisitionControl
Values	Description
<i>Basic</i>	<code>ExposureTime</code> has the priority over <code>AcquisitionFrameRate</code> . If <code>ExposureTime</code> gets longer than the inverse of <code>AcquisitionFrameRate</code> , the resulting acquisition frame rate is reduced accordingly.

## AcquisitionMode

Selects the acquisition mode of the camera. The feature defines mainly the number of frames to capture during an acquisition and the way the acquisition stops.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LineMode, TriggerSource, LineInverter, LineSource
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Continuous</i>	After an <b>AcquisitionStart</b> event: Selects continuous image acquisition until acquisition stop is triggered.
<i>MultiFrame</i>	A number of images is acquired that is specified by <b>AcquisitionFrameCount</b> . Further trigger events will be ignored until acquisition is stopped and restarted.  In case of <i>MultiFrame</i> , acquisition can be stopped using <b>AcquisitionStop</b> command before it reaches the number of frames specified in <b>AcquisitionFrameCount</b> . So, the <b>AcquisitionStop</b> trigger event will not be ignored.
<i>SingleFrame</i>	Single images are acquired. Further trigger events will be ignored until acquisition is stopped and restarted.

## AcquisitionStart

Starts the acquisition of the camera.

**Note:** The number of frames captured is specified by **AcquisitionMode**.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Start
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

## AcquisitionStatus

[AcquisitionStatusSelector]

Displays the state of the internal acquisition signal selected using **AcquisitionStatusSelector**.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Status
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>False</i>	The camera is performing the selected action.
<i>True</i>	The camera is performing the selected action.

## AcquisitionStatusSelector

Selects the internal acquisition signal to read using **AcquisitionStatus**.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Status Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionStatus
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Acquisition Active</i>	The camera acquires one or many frames.
<i>Acquisition Transfer</i>	The camera transfers one or many frames to the host.

## AcquisitionStop

Stops the acquisition of the camera at the end of the current frame.

**Note:** This feature is mainly used when **AcquisitionMode** is *Continuous*, but it can be used in any acquisition mode.

<b>Interface support</b>	All
<b>Display name</b>	Acquisition Stop
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

## ClockTriggerFrequency

Controls the frequency for synchronous image acquisition when using PTP (IEEE 1588 Precision Time Protocol).

<b>Interface support</b>	GigE
<b>Display name</b>	Clock Trigger Frequency
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
Camera model dependent	Minimum
Camera model dependent	Maximum

## ClockTriggerTimestamp

Controls the timestamp for the first trigger in synchronous image acquisition using PTP.

**Note:** For Mako and Manta cameras, **AquisitionTimeGate** is the equivalent feature.

<b>Interface support</b>	GigE
<b>Display name</b>	Clock Trigger Timetamp
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
0	Minimum
9223372036854775807	Maximum



## ExposureActiveMode

Selects the mode for the `ExposureActive` signal. You can use this feature for synchronizing strobe lights to compensate for the rolling shutter effect.

**Note:** Global shutter cameras support only *FlashWindow*, other cameras support *FirstLine* and *FlashWindow*.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Active Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LineInverter, LineMode, LineSelector, LineSource, LineStatus, LineStatusAll, TimerDelay, TimerDuration, TimerReset, TimerSelector, TimerStatus, TimerTriggerActivation, TimerTriggerSource, TriggerSelector
<b>Category</b>	/AcquisitionControl

Values	Description
<i>FirstLine</i>	Sets the <code>ExposureActive</code> signal to high when the first line is exposing.
<i>FlashWindow</i>	Sets the <code>ExposureActive</code> signal to high when all lines are exposing simultaneously.

## ExposureAuto

Selects the auto exposure mode.

**Note:** The output of the auto exposure function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Auto
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Continuous</i>	The exposure time varies continuously according to the scene illumination.
<i>Off</i>	Automatic mode is disabled.
<i>Once</i>	Automatic exposure is applied once until the target value of the selected auto control algorithm is achieved, then the value returns to <i>Off</i> .

## ExposureMode

Selects the operation mode of the exposure (or shutter).

### Notes:

- A delay may occur between the trigger signal and the start of the exposure. For the delay with rolling shutter sensor cameras, see your Alvim camera's user guide.
- For *TriggerWidth* and *TriggerControlLed*, the resulting exposure time is extended, because of an exposure offset after the trigger pulse.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Value	Description
<i>Timed</i>	The exposure time is set by <code>ExposureTime</code> or <code>ExposureAuto</code> .
<i>TriggerControlLed</i> <sup>2</sup>	One or more trigger signals control the exposure time independently from the current frame triggers.
<i>TriggerWidth</i> <sup>1,2</sup>	The width of the current frame trigger signal(s) pulse controls the exposure time.

<sup>1</sup>Controlling the exposure time using *TriggerWidth*: We recommend you to follow the workflow shown in [ExposureMode- Using TriggerWidth](#) on page 100.

<sup>2</sup>Global shutter sensor cameras only.

## ExposureMode - Using TriggerWidth

Follow the workflow shown in [Figure 6](#) to use *TriggerWidth*.

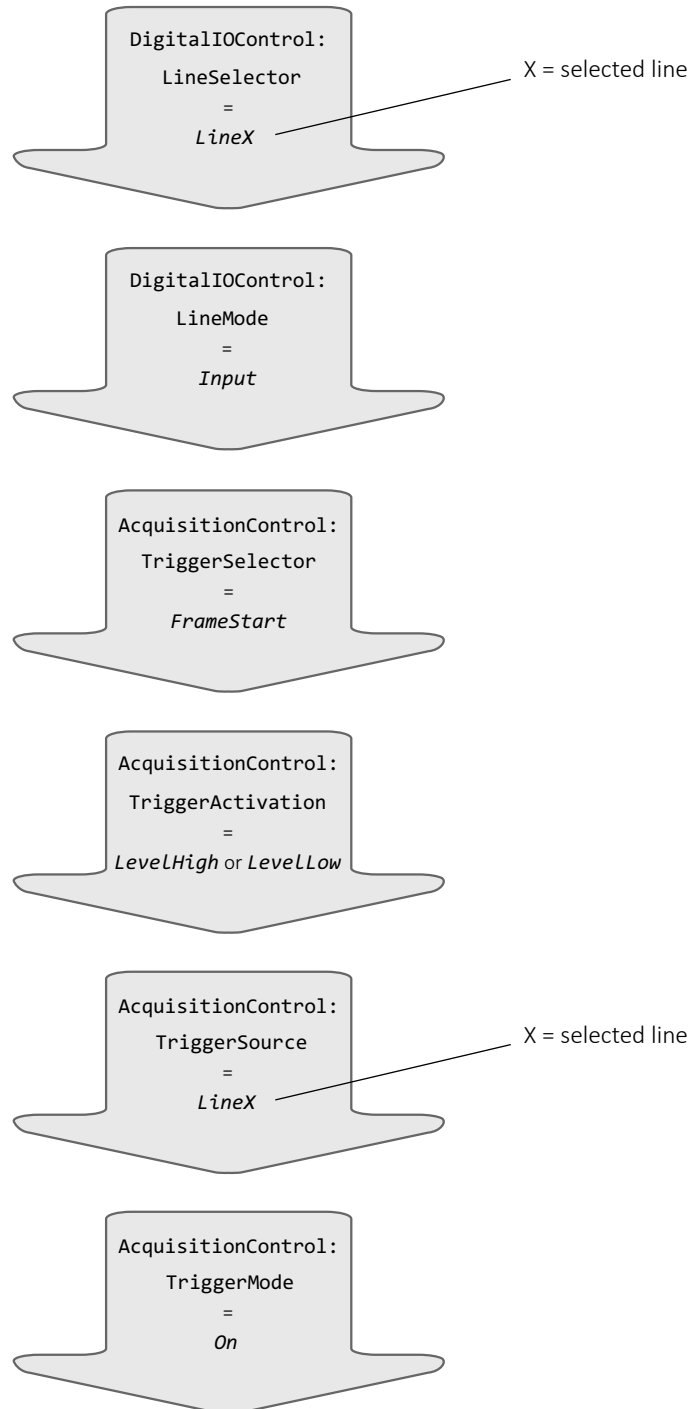


Figure 6: Workflow for using *TriggerWidth*

## ExposureTime

Selects the exposure time when `ExposureMode` is *Timed* and `ExposureAuto` is *Off*. This controls the duration where the photosensitive cells are exposed to light.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Time
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Microseconds
<b>Affected features</b>	ExposureAutoMin, ExposureAutoMax, AcquisitionFrameRate
<b>Category</b>	/AcquisitionControl

## TriggerActivation

[TriggerSelector]

Selects the electrical signal level of the trigger.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Activation
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>AnyEdge</i>	The encoder on the falling or rising edge of the signal is reset.
<i>FallingEdge</i>	The encoder on the falling edge of the signal is reset.
<i>LevelHigh</i>	The encoder at a high signal level is reset.
<i>LevelLow</i>	The encoder at a low signal level is reset.
<i>RisingEdge</i>	The encoder on the rising edge of the signal is reset.

## TriggerDelay

[TriggerSelector]

Controls the period of time before the camera corresponds after receiving a trigger signal.

### Notes:

- Available only when **TriggeSelector** is set to *FrameStart* or *AcquisitionStart*.
- The value for **TriggerDelay** adds to the sensor related delay between trigger and exposure start. The sensor related delay depends on such as data rate and sensor characteristics.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Delay
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
0	Minimum
20748634.2705	Maximum

## TriggerMode

[TriggerSelector]

Enables or disables the selected trigger.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LineMode, TriggerSource, LineInverter, LineSource
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Off</i>	Triggering is disabled.
<i>On</i>	Triggering is enabled

## TriggerSelector

Selects the type of trigger to configure.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	TriggerMode, LineMode, TriggerSoftware, LineInverter, LineSource, TriggerSource, TriggerActivation
<b>Category</b>	/AcquisitionControl

Values	Description
<i>AcquisitionActive</i>	The selected trigger controls the duration of the acquisition of a single frame or many frames. The acquisition is activated when the trigger signal becomes active and terminated when it goes back to the inactive state.
<i>AcquisitionEnd</i>	The trigger terminates the acquisition process.
<i>AcquisitionStart</i>	The selected trigger starts the acquisition process.
<i>ExposureActive*</i>	The selected trigger controls the duration of exposure of a single frame (when acquisition is running).
<i>ExposureStart*</i>	The selected trigger starts the exposure of a single frame (when acquisition is running).
<i>ExposureEnd*</i>	The selected trigger ends the exposure of a single frame (when acquisition is running).
<i>FrameStart</i>	The selected trigger starts the capture of a single frame (when acquisition is running).

\* Not supported by cameras using rolling shutter sensors.



## TriggerSoftware

[TriggerSelector]

Generates an internal trigger. **TriggerSource** must be set to *Software*.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Software
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

## TriggerSource

[TriggerSelector]

Selects the internal signal or physical input line to use as the trigger source.

**Note:** The selected trigger must have its **TriggerMode** set to **On**.

<b>Interface support</b>	All
<b>Display name</b>	Trigger Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Action0</i> <sup>1</sup>	Action0 command is used to signal triggers.
<i>Action1</i> <sup>1</sup>	Action1 command is used to signal triggers.
<i>Counter0Active</i>	Counter0Active is used to signal triggers.
<i>Counter1Active</i>	Counter1Active is used to signal triggers.
<i>Counter2Active</i>	Counter2Active is used to signal triggers.
<i>Counter3Active</i>	Counter3Active is used to signal triggers.
<i>Line0</i>	Physical Line0 is used to signal triggers.
<i>Line1</i>	Physical Line1 is used to signal triggers.
<i>Line2</i> <sup>2</sup>	Physical Line2 is used to signal triggers.
<i>Line3</i> <sup>2</sup>	Physical Line3 is used to signal triggers.
<i>Off</i>	Triggering is disabled.
<i>Software</i>	Software is used to signal triggers.
<i>SoftwareSignal0</i>	SoftwareSignal0 is used to signal triggers.
<i>SoftwareSignal1</i>	SoftwareSignal1 is used to signal triggers.
<i>Timer0Active</i>	Timer0Active is used to signal triggers.
<i>Timer1Active</i>	Timer1Active is used to signal triggers.

<sup>1</sup> Currently, available with Alvium GigE cameras only.

<sup>2</sup> Available with Alvium GigE and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

## ActionControl

**Note:** Features in this category are **available for Alvium GigE cameras only**. Support for the other Alvium series is intended for a future firmware release.

The features in this category can be used by external devices to trigger actions within the camera by software commands. This includes ToE (Trigger over Ethernet) where the GigE interface is used for triggering instead of the I/Os.

See [SoftwareSignalControl](#) on page 262 for the interaction with features in this category.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## ActionDeviceKey

Controls the device key that allows the device to check the validity of action commands.

### Notes:

- **ActionDeviceKey** has the unconventional access mode "write only" to make sure that the primary application alone has control over it.
- The device internal assertion of an action signal is only authorized if the **ActionDeviceKey** and the action device key value in the protocol message are equal.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Device Key
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum (32 Bits)

## ActionGroupKey

[ActionSelector]

Controls the key that the device will use to validate the action on reception of the action protocol message.

The device asserts the selected Action signal only if:

- The camera's **ActionDeviceKey** is equal to the action device key in the action protocol message.
- The bitwise AND operation of the action group mask in the action protocol message against the selected **ActionGroupMask** is non-zero.
- The camera's **ActionGroupKey** is equal to the action group key in the action protocol message.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Key
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

## ActionGroupMask

[ActionSelector]

Controls the mask that the device will use to validate the action on reception of the action protocol message.

The device asserts the selected Action signal only if:

- The camera's **ActionDeviceKey** is equal to the action device key in the action protocol message.
- The bitwise AND operation of the action group mask in the action protocol message against the selected **ActionGroupMask** is non-zero.
- The camera's **ActionGroupKey** is equal to the action group key in the action protocol message.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Group Mask
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
4294967295	Maximum

## ActionQueueSize

[ActionSelector]

Displays the size of the scheduled action commands queue. This number represents the maximum number of scheduled action commands that can be pending at a given point in time.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Queue Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/ActionControl
<b>Values</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## ActionSelector

Selects to which Action Signal further Action settings apply.

<b>Interface support</b>	GigE
<b>Display name</b>	Action Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	ActionGroupKey, ActionGroupMask, ActionQueueSize
<b>Category</b>	/ActionControl

Values	Description
0	Minimum
1	Maximum

## AnalogControl

The features in this category can be used to control the intensity levels for Date of document release and color imaging.

<b>Interface support</b>	All
<b>Display name</b>	Analog Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## BalanceRatio

[BalanceRatioSelector]

Controls the ratio of the selected color component to the green color component. This feature is used for white balance.

<b>Interface support</b>	All
<b>Display name</b>	Balance Ratio
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AnalogControl

Values	Description
0	Minimum
8	Maximum
0.001	Increment



## BalanceRatioSelector

Selects the balance ratio to control.

<b>Interface support</b>	All
<b>Display name</b>	Balance Ratio Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	BalanceRatio
<b>Category</b>	/AnalogControl

Values	Description
<i>Red</i>	The red channel is adjusted.
<i>Blue</i>	The blue channel is adjusted.

## BalanceWhiteAuto

Selects the auto white balance mode.

<b>Interface support</b>	All
<b>Display name</b>	Balance White Auto
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	BalanceWhiteAutoRate, BalanceWhiteAutoTolerance
<b>Category</b>	/AnalogControl

Values	Description
<i>Continuous</i>	Auto white balance is applied continuously.
<i>Once</i>	Auto white balance is applied once. After adjustments have been done, auto white balance is disabled.
<i>Off</i>	Auto white balance is disabled.

## BlackLevel

[BlackLevelSelector]

Controls the analog black level as an absolute physical value. The feature represents a DC offset applied to the video signal.

<b>Interface support</b>	All
<b>Display name</b>	Black Level
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AnalogControl

Values	Description
1	Increment

## BlackLevelSelector

Selects the black level to be controlled by the various black level features.

<b>Interface support</b>	All
<b>Display name</b>	Black Level Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	BlackLevel
<b>Category</b>	/AnalogControl

Value	Description
<i>ALL</i>	All black levels are controlled.

## Gain

[GainSelector]

Controls the selected gain as an absolute physical value. This is an amplification factor applied to the video signal.

<b>Interface support</b>	All
<b>Display name</b>	Gain
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Decibels [dB]
<b>Affected features</b>	GainAutoMin, GainAutoMax
<b>Category</b>	/AnalogControl

Values	Description
<i>0.1</i>	Increment

## GainAuto

[GainSelector]

Selects the auto gain mode.

**Note:** The output of the auto gain function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Gain Auto
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AnalogControl

Values	Description
<i>Continuous</i>	Gain is continuously adjusted to keep the value set for <b>IntensityControllerTarget</b> . This is triggered by such as changes in illumination or in object brightness.
<i>Once</i>	Auto gain is being applied once. After adjustments have been done, gain is disabled.
<i>Off</i>	Auto gain is disabled.

## GainSelector

Selects the gain to be controlled by the various gain features.

<b>Interface support</b>	All
<b>Display name</b>	Gain Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Gain, GainAuto, GainAutoMax
<b>Category</b>	/AnalogControl

Value	Description
<i>ALL</i>	All gains are controlled.

## Gamma

Controls the gamma correction of pixel intensity.

<b>Interface support</b>	All
<b>Display name</b>	Gamma
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AnalogControl

Values	Description
<i>0.4</i>	Minimum
<i>2.4</i>	Maximum
<i>0.5</i>	Increment

## AutoModeControl

The features in this category enable auto functions for white balance, gain, and exposure time.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## AutoModeRegionHeight

[AutoModeRegionSelector]

Controls the height of the region used to measure values for all auto functions.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Region Height
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionOffsetY
<b>Category</b>	/AutoModeControl

## AutoModeRegionOffsetX

[AutoModeRegionSelector]

Controls the horizontal position of the window used to measure the actual value for the auto function.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Region OffsetX
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionWidth
<b>Category</b>	/AutoModeControl

## AutoModeRegionOffsetY

[AutoModeRegionSelector]

Controls the vertical position of the window used to measure the actual value for the auto function.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Region OffsetY
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionHeight
<b>Category</b>	/AutoModeControl

## AutoModeRegionSelector

Selects the auto mode region to configure.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Region Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AutoModeRegionWidth, AutoModeRegionOffsetX, AutoModeRegionHeight, AutoModeRegionOffsetY
<b>Category</b>	/AutoModeControl

<b>Value</b>	<b>Description</b>
<i>AutoModeRegion1</i>	Auto Mode Region 1 is configured.

## AutoModeRegionWidth

[AutoModeRegionSelector]

Controls the width of the window used to measure the actual value for the auto function.

<b>Interface support</b>	All
<b>Display name</b>	Auto Mode Region Width
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionOffsetX
<b>Category</b>	/AutoModeControl

## BalanceWhiteAutoRate

Controls the frequency of white balance adjustments.

<b>Interface support</b>	All
<b>Display name</b>	Balance White Auto Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	BalanceWhiteAutoTolerance
<b>Category</b>	/AutoModeControl

Values	Description
1	Minimum
100	Maximum
1	Increment

## BalanceWhiteAutoTolerance

Controls the deviation of the current white balance value from the ideal value at which the white balance is adjusted.

<b>Interface support</b>	All
<b>Display name</b>	Balance White Auto Tolerance
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	BalanceWhiteAutoRate
<b>Category</b>	/AutoModeControl

Values	Description
0	Minimum
50	Maximum
1	Increment

## ExposureAutoMax

Controls the maximum value for auto exposure.

**Note:** The output of the auto exposure function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Auto Max
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	ExposureAutoMin
<b>Category</b>	/AutoModeControl



## ExposureAutoMin

Controls the minimum value for auto exposure.

**Note:** The output of the auto exposure function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Exposure Auto Min
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	ExposureAutoMax
<b>Category</b>	/AutoModeControl

## GainAutoMax

Controls the maximum value for auto gain.

**Note:** The output of the auto gain function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Gain Auto Max
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	GainAutoMin
<b>Category</b>	/AutoModeControl

## GainAutoMin

Controls the minimum value for auto gain.

**Note:** The output of the auto gain function affects the whole image.

<b>Interface support</b>	All
<b>Display name</b>	Gain Auto Min
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	GainAutoMax
<b>Category</b>	/AutoModeControl

## IntensityAutoPrecedence

Selects the precedence of intensity controller.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Auto Precedence
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
<i>MinimizeBlur</i>	Orders the control loops so that image blur is minimized: gain first, exposure time second. Long exposure times are avoided if possible.
<i>MinimizeNoise</i>	Orders the control loops so that noise is minimized: exposure time first, gain second. Gain increases are avoided if possible.

## IntensityControllerAlgorithm

[IntensityControllerSelector]

Selects the algorithm determining how the histogram is used to determine the current intensity value.

**Note:** The outliers are disregarded.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Algorithm
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
<i>Mean</i>	After comparing the arithmetic mean of the current image's histogram to <b>ExposureAutoTarget</b> , the exposure time for the next image is adjusted to meet this target. Bright areas are allowed to saturate.

## IntensityControllerRate

Controls the rate at which the controller should compute an intensity value.

**Note:** This value also defines the period at which the associated auto functions change their control value.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
<i>1</i>	Minimum
<i>100</i>	Maximum

## IntensityControllerRegion

Selects the subregion of the image that the intensity controller operates on.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Region
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
<i>AutoModeRegion1</i>	The intensity controller controls Auto Mode Region 1.
<i>FullImage</i>	The intensity controller controls the full sensor area.

## IntensityControllerSelector

Selects the intensity controller to configure.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	IntensityControllerTolerance, IntensityControllerAlgorithm
<b>Category</b>	/AutoModeControl

Value	Description
<i>IntensityController1</i>	Intensity Controller 1 is selected to be configured.

## IntensityControllerTarget

Controls the target intensity value for auto intensity control as deviation from the mean value in [percent]. The default value for all auto features is 50.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Target
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Percent [%]
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
<i>10</i>	Minimum
<i>89.9</i>	Maximum
<i>0.0001</i>	Increment
<i>50</i>	Default

## IntensityControllerTolerance

Controls the deviation of the current value from the target value at which the feature is inactive.

<b>Interface support</b>	All
<b>Display name</b>	Intensity Controller Tolerance
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AutoModeControl

Values	Description
0	Minimum
50	Maximum
1	Increment

## ChunkDataControl

The features in this category enable including image parameters at the end of the image payload.



### **Payload size is affected**

Observe that chunk data increases the total payload size of an image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Data Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## Functional overview

Select image parameter to be included in chunk data separately:

1. Set **ChunkSelector** to the image parameter you want to include at the end of the image payload.
2. Set **ChunkEnable** = *True* to confirm this selection.

Activate including image parameters at the end of the image payload:

3. Set **ChunkModeActive** = *True* to include the selected image parameters at the end of the image payload.

## ChunkBalanceRatioBlue

[ChunkSelector]

Returns the blue color gain of the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Balance Ratio Blue
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

Values	Description
0	Minimum
8	Maximum

## ChunkBalanceRatioRed

[ChunkSelector]

Returns the red color gain of the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Balance Ratio Red
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

Values	Description
0	Minimum
8	Maximum

## ChunkEnable

[ChunkSelector]

Confirms to include the selected image parameters at the end of the image payload.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	All other features in this category
<b>Category</b>	/ChunkDataControl

Values	Description
<i>False</i>	Settings for chunk data are disabled (default).
<i>True</i>	Settings for chunk data is enabled.

## ChunkExposureTime

[ChunkSelector]

Returns the exposure time used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Exposure Time
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl



## ChunkGain

[ChunkSelector]

Returns the gain used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Gain
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Decibels [dB]
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

Values	Description
Camera model dependent	Minimum
0.1	Increment
Camera model dependent	Maximum

## ChunkHeight

[ChunkSelector]

Returns the height used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Height
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

## ChunkLineStatusAll

[ChunkSelector]

Returns the current status of every input or output line in a sequence from Line0 to LineN in a single bitfield.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Line Status All
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

Values	Description
0	Minimum (no I/O lines are active)
15	Maximum (all I/O lines are active)

## ChunkModeActive

Enables or disables image parameters to be included at the end of the image payload.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Mode Active
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	All other features in this category
<b>Category</b>	/ChunkDataControl

Values	Description
<i>False</i>	Chunk data is excluded from the payload (default).
<i>True</i>	Chunk data is included in the payload.

## ChunkOffsetX

[ChunkSelector]

Returns the **OffsetX** value used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Offset X
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

## ChunkOffsetY

[ChunkSelector]

Returns the **OffsetY** value used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Offset Y
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

## ChunkSelector

Selects which chunk to enable or disable.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	All chunk features, except for <code>ChunkModeActive</code> and <code>ChunkSelector</code>
<b>Category</b>	/ChunkDataControl

Values	Description
<i>BalanceRatioBlue</i>	The corresponding feature is selected to be included in the payload of the corresponding image.
<i>BalanceRatioRed</i>	
<i>ExposureTime</i>	
<i>Gain</i>	
<i>Height</i>	
<i>LineStatusAll</i>	
<i>OffsetX</i>	
<i>OffsetY</i>	
<i>SequencerActive</i>	
<i>Timestamp</i>	
<i>Width</i>	

## ChunkSequencerSetActive

[ChunkSelector]

Returns the value for the active sequencer set used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Sequencer Set Active
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

Values	Description
0	Sequencer set 0 is active.
N	Sequencer set N is active.
255	The sequencer is disabled.

## ChunkTimestamp

[ChunkSelector]

Returns the timestamp of the image at the time of the *FrameStart* internal event.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Timestamp
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Ticks = Nanoseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

## ChunkWidth

[ChunkSelector]

Returns the width used to capture the image.

<b>Interface support</b>	All
<b>Display name</b>	Chunk Width
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/ChunkDataControl

## ColorTransformationControl

The features in this category can be used to control the interpolation of the RGB channels for the color image output, and simple access to hue and saturation.

<b>Interface support</b>	All
<b>Display name</b>	Color Transformation Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

This section describes features related to color transformations in color cameras. The following features are only valid if 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  $3 \times 3$  matrix. This color transformation allows to change the coefficients of the  $3 \times 3$  matrix.

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

## ColorTransformationEnable

[ColorTransformationSelector]

Enables or disables the selected color transformation module.

<b>Interface support</b>	All
<b>Display name</b>	Color Transformation Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	ColorTransformationValue
<b>Category</b>	/ColorTransformationControl

Values	Description
<i>True</i>	The selected color transformation module is enabled.
<i>False</i>	The selected color transformation module is disabled.

## ColorTransformationValue

[ColorTransformationSelector][ColorTransformationValue-Selector]

Selects the gain factor or offset for the selected color transformation.

<b>Interface support</b>	All
<b>Display name</b>	Color Transformation Value
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ColorTransformationControl

Values	Description
-4	Minimum
+4	Maximum
1	Default



## ColorTransformationValueSelector

[ColorTransformationSelector]

Selects the gain factor or offset of the Transformation matrix for the selected Color Transformation module.

<b>Interface support</b>	All
<b>Display name</b>	Color Transformation Value Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	ColorTransformationValue
<b>Category</b>	/ColorTransformationControl

For values described in the following table, see [ColorTransformationControl](#) on page 135 for the color transformation matrix.

Values	Description
<i>Gain00</i>	Gain 00 for the red contribution to the red pixel (multiplicative factor) is selected.
<i>Gain01</i>	Gain 01 for the green contribution to the red pixel (multiplicative factor) is selected.
<i>Gain02</i>	Gain 02 for the red contribution to the red pixel (multiplicative factor) is selected.
<i>Gain10</i>	Gain 10 for the red contribution to the green pixel (multiplicative factor) is selected.
<i>Gain11</i>	Gain 11 for the green contribution to the green pixel (multiplicative factor) is selected.
<i>Gain12</i>	Gain 12 for the blue contribution to the green pixel (multiplicative factor) is selected.
<i>Gain20</i>	Gain 20 for the red contribution to the blue pixel (multiplicative factor) is selected.
<i>Gain21</i>	Gain 21 for the green contribution to the blue pixel (multiplicative factor) is selected.
<i>Gain22</i>	Gain 22 for the blue contribution to the blue pixel (multiplicative factor) is selected.

## Hue

Controls the color tone correction by rotating the chrominance field clockwise with values > 0 and counter clockwise with values < 0 in degrees [°].

<b>Interface support</b>	All
<b>Display name</b>	Hue
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Degrees [°]
<b>Affected features</b>	PixelFormat, DeviceLinkThroughputLimit, ExposureAutoMin, ExposureAutoMax, ExposureTime, AcquisitionFrameRate, Width, OffsetX, AutoModeRegionWidth, AutoModeRegionOffsetX, AutoModeRegionHeight, AutoModeRegionOffsetY, PayloadSize, WidthMax, Height, OffsetY, HeightMax, PixelSize, ContrastEnable, ContrastDarkLimit, ContrastBrightLimit, BlackLevel, Saturation, ColorTransformationEnable, ColorTransformationValue
<b>Category</b>	/ColorTransformationControl

Values	Description
-40	Minimum (40 degrees)
+40	Maximum (40 degrees)
0	Default

## Saturation

Controls the amplification of the chrominance signal in the color space.

<b>Interface support</b>	All
<b>Display name</b>	Saturation
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ColorTransformationControl

Values	Description
0	Minimum
+2	Maximum
1	Default

## CorrectionControl

The features in this category can be used to control DPC (Defect pixel correction) and FPNC (Fixed pattern noise correction) for image correction.

<b>Interface support</b>	All
<b>Display name</b>	Correction Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## CorrectionMode

Enables or disables correction features.

<b>Interface support</b>	All
<b>Display name</b>	Correction Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CorrectionControl

Values	Description
<i>Off</i>	Correction features are disabled.
<i>On</i>	Correction features are enabled.

## CorrectionSelector

Selects the type of correction to configure.

<b>Interface support</b>	All
<b>Display name</b>	Correction Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	CorrectionMode, CorrectionSet, CorrectionSetDefault, CorrectionDataSize, CorrectionEntryType
<b>Category</b>	/CorrectionControl

Values	Description
<i>DefectPixelCorrection*</i>	Defect pixel correction (DPC) is selected.
<i>FixedPatternNoiseCorrection*</i>	Fixed pattern noise correction (FPNC) is selected.

\* Availability is camera model dependent.

## CorrectionSet

[CorrectionSelector]

Selects the currently enabled correction settings.

<b>Interface support</b>	All
<b>Display name</b>	Correction Set
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/(W)
<b>Affected features</b>	Not applicable
<b>Category</b>	/CorrectionControl

Values	Description
<i>Preset</i>	Factory settings are enabled (default).
<i>User*</i>	User settings are enabled.

\* Available only if a user correction set has been written to the camera memory.

## CorrectionSetDefault

[CorrectionSelector]

Selects the correction set used when the camera is reset.

<b>Interface support</b>	All
<b>Display name</b>	Correction Set Default
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CorrectionControl
<b>Values</b>	<b>Description</b>
<i>Preset</i>	Factory settings are used after camera reset.
<i>User*</i>	User settings are used after camera reset.

\* Available only if a user correction set has been written to the camera memory.

## CorrectionInfo (subcategory)

The features in this subcategory can be used to display the correction type currently used.

<b>Interface support</b>	All
<b>Display name</b>	Correction Info
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Subcategory
<b>Category</b>	/CorrectionControl

## CorrectionDataSize

[CorrectionSelector]

Displays the current size of the correction data that is stored inside the camera.

<b>Interface support</b>	All
<b>Display name</b>	Correction Data Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CorrectionControl/CorrectionInfo

## CorrectionEntryType

Displays the entry type (correction type specific variant).

<b>Interface support</b>	All
<b>Display name</b>	Correction Entry Type
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CorrectionControl/CorrectionInfo

## CounterAndTimerControl

The features in this category can be used to control counters and timers to enable advanced triggering. For example, you can synchronize the timing for image acquisition with strobe lights, using these features.

<b>Interface support</b>	All
<b>Display name</b>	Counter And Timer Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## CounterDuration

[CounterSelector]

Controls the period of time until a *CounterEnd* event is generated, the *CounterActive* signal becomes inactive, and the counter is stopped.

### Notes:

- The counter is stopped until a new trigger occurs.
- The counter can be reset by **CounterReset**.

<b>Interface support</b>	All
<b>Display name</b>	Counter Duration
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Values	Description
0	Minimum
4294967295	Maximum



## CounterEventActivation

[CounterSelector]

Selects the edge type of the electrical signal related to the event defined by CounterEventSource to increment the counter.

**Note:** The electrical signal level of the trigger to activate the counter is selected by CounterTriggerActivation.

<b>Interface support</b>	All
<b>Display name</b>	Counter Event Activation
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>AnyEdge</i>	The encoder on the falling or rising edge of the signal is reset.
<i>FaLLingEdge</i>	The encoder on the falling edge of the signal is reset.
<i>RisingEdge</i>	The encoder on the rising edge of the signal is reset.

## CounterEventSource

[CounterSelector]

Selects the event to increment the counter.

**Note:** Use `CounterEventActivation` to define which electrical state of the signal you want to be used.

<b>Interface support</b>	All
<b>Display name</b>	Counter Event Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>AcquisitionActive</i>	The <i>AcquisitionActive</i> signal increments the counter.
<i>Action0</i>	The <i>Action0</i> signal increments the counter.
<i>Action1</i>	The <i>Action1</i> signal increments the counter.
<i>Counter0Active</i>	The <i>Counter0Active</i> signal increments the counter.
<i>Counter1Active</i>	The <i>Counter1Active</i> signal increments the counter.
<i>Counter2Active</i>	The <i>Counter2Active</i> signal increments the counter.
<i>Counter3Active</i>	The <i>Counter3Active</i> signal increments the counter.
<i>ExposureActive</i>	The <i>ExposureActive</i> signal increments the counter.
<i>Line0</i>	A trigger signal on Line0 increments the counter.
<i>Line1</i>	A trigger signal on Line1 increments the counter.
<i>Line2</i>	A trigger signal on Line2 increments the counter.
<i>Line3</i>	A trigger signal on Line3 increments the counter.
<i>Off</i>	The feature is disabled.
<i>SoftwareSignal0</i>	The <i>SoftwareSignal0</i> signal increments the counter.
<i>SoftwareSignal1</i>	The <i>SoftwareSignal1</i> signal increments the counter.
<i>Timer0Active</i>	The <i>Timer0Active</i> signal increments the counter.
<i>Timer1Active</i>	The <i>Timer1Active</i> signal increments the counter.

## CounterReset

[CounterSelector]

Resets and restarts the selected counter.

**Note:** The counter is incremented immediately after the reset unless a counter trigger is active.

<b>Interface support</b>	All
<b>Display name</b>	Counter Reset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	CounterDuration, CounterStatus, CounterTriggerActivation, CounterTriggerSource, CounterValue
<b>Category</b>	/CounterAndTimerControl

## CounterResetActivation

[CounterSelector]

Selects the electrical signal level of the trigger to reset the counter.

<b>Interface support</b>	All
<b>Display name</b>	Counter Reset Activation
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>AnyEdge</i>	The encoder on the falling or rising edge of the signal is reset.
<i>FallingEdge</i>	The encoder on the falling edge of the signal is reset.
<i>LevelHigh</i>	The encoder at a high signal level is reset.
<i>LevelLow</i>	The encoder at a low signal level is reset.
<i>RisingEdge</i>	The encoder on the rising edge of the signal is reset.

## CounterResetSource

[CounterSelector]

Selects the event to reset the counter.

<b>Interface support</b>	All
<b>Display name</b>	Counter Reset Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>AcquisitionActive</i>	The <i>AcquisitionActive</i> signal resets the counter.
<i>Counter0Active</i>	The <i>Counter0Active</i> signal resets the counter.
<i>Counter1Active</i>	The <i>Counter1Active</i> signal resets the counter.
<i>Counter2Active</i>	The <i>Counter2Active</i> signal resets the counter.
<i>Counter3Active</i>	The <i>Counter3Active</i> signal resets the counter.
<i>ExposureActive</i>	The <i>ExposureActive</i> signal resets the counter.
<i>Line0</i>	A trigger signal on Line0 resets the counter.
<i>Line1</i>	A trigger signal on Line1 resets the counter.
<i>Line2</i>	A trigger signal on Line2 resets the counter.
<i>Line3</i>	A trigger signal on Line3 resets the counter.
<i>Off</i>	The feature is disabled.
<i>SoftwareSignal0</i>	The <i>SoftwareSignal0</i> signal resets the counter.
<i>SoftwareSignal1</i>	The <i>SoftwareSignal1</i> signal resets the counter.
<i>Timer0Active</i>	The <i>Timer0Active</i> signal resets the counter.
<i>Timer1Active</i>	The <i>Timer1Active</i> signal resets the counter.

## CounterSelector

Selects the counter to configure.

<b>Interface support</b>	All
<b>Display name</b>	Counter Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>Counter0</i>	<i>Counter0Active</i> is selected.
<i>Counter1</i>	<i>Counter1Active</i> is selected.
<i>Counter2</i>	<i>Counter2Active</i> is selected.
<i>Counter3</i>	<i>Counter3Active</i> is selected.

## CounterStatus

[CounterSelector]

Displays the current status of the counter.

<b>Interface support</b>	All
<b>Display name</b>	Counter Status
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>CounterActive</i>	The counter is counting for the period of time specified by <i>CounterDuration</i> .
<i>CounterCompleted</i>	The counter has reached the <i>CounterDuration</i> value.
<i>CounterOverflow</i>	The counter has reached its maximum possible count.
<i>CounterTriggerWait</i>	The counter is waiting for a start trigger.
<i>Idle</i>	The counter is inactive.

## CounterTriggerActivation

[CounterSelector]

Selects the electrical signal level of the trigger to activate the counter.

<b>Interface support</b>	All
<b>Display name</b>	Counter Trigger Activation
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

<b>Value</b>	<b>Description</b>
<i>AnyEdge</i>	The encoder on the falling or rising edge of the signal is reset.
<i>FaLLingEdge</i>	The encoder on the falling edge of the signal is reset.
<i>LevelHigh</i>	The encoder at a high signal level is reset.
<i>LevelLow</i>	The encoder at a low signal level is reset.
<i>RisingEdge</i>	The encoder on the rising edge of the signal is reset.

## CounterTriggerSource

[CounterSelector]

Selects the event to trigger the counter.

<b>Interface support</b>	All
<b>Display name</b>	Counter Trigger Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

<b>Value</b>	<b>Description</b>
<i>AcquisitionActive</i>	The <i>AcquisitionActive</i> signal starts the counter.
<i>Counter0Active</i>	The <i>Counter0Active</i> signal starts the counter.
<i>Counter1Active</i>	The <i>Counter1Active</i> signal starts the counter.
<i>Counter2Active</i>	The <i>Counter2Active</i> signal starts the counter.
<i>Counter3Active</i>	The <i>Counter3Active</i> signal starts the counter.
<i>ExposureActive</i>	The <i>ExposureActive</i> signal starts the counter.
<i>Line0</i>	A trigger signal on Line0 starts the counter.
<i>Line1</i>	A trigger signal on Line1 starts the counter.
<i>Line2</i>	A trigger signal on Line2 starts the counter.
<i>Line3</i>	A trigger signal on Line3 starts the counter.
<i>Off</i>	The feature is disabled.
<i>SoftwareSignal0</i>	The <i>SoftwareSignal0</i> signal starts the counter.
<i>SoftwareSignal1</i>	The <i>SoftwareSignal1</i> signal starts the counter.
<i>Timer0Active</i>	The <i>Timer0Active</i> signal starts the counter.
<i>Timer1Active</i>	The <i>Timer1Active</i> signal starts the counter.

## CounterValue

[CounterSelector]

Controls the current value of the selected counter.

**Note:** Writing to CounterValue is typically used to set the start value.

<b>Interface support</b>	All
<b>Display name</b>	Counter Value
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
0	Minimum
4294967295	Maximum

## CounterValueAtReset

[CounterSelector]

Displays the latest value of the selected counter before it was reset by a trigger or by an explicit CounterReset command.

<b>Interface support</b>	All
<b>Display name</b>	Counter Value At Reset
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
0	Minimum
4294967295	Maximum



## TimerDelay

[TimerSelector]

Controls the duration of the delay at the reception of a trigger before starting the timer.

<b>Interface support</b>	All
<b>Display name</b>	Timer Delay
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl
<b>Values</b>	<b>Description</b>
0	Minimum
429496729.5	Maximum

## TimerDuration

[TimerSelector]

Controls the duration of the timer pulse.

When the timer reaches the TimerDuration value:

- For **TimerStatus**, the value is changed from *TimerActive* to *TimerCompleted*.
- The timer stops counting until the camera receives a new trigger, or until the timer is explicitly reset with **TimerReset**.

<b>Interface support</b>	All
<b>Display name</b>	Timer Duration
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Values	Description
0	Minimum
429496729.5	Maximum

## TimerReset

[TimerSelector]

The selected timer is reset by software and restarted.

**Note:** The timer starts immediately after the reset unless a timer trigger is active.

<b>Interface support</b>	All
<b>Display name</b>	Timer Reset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	TimerDelay, TimerDuration, TimerStatus, TimerSelector, TimerTriggerActivation, TimerTriggerSource
<b>Category</b>	/CounterAndTimerControl

## TimerSelector

Selects the timer to be configured.

<b>Interface support</b>	All
<b>Display name</b>	Timer Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	TimerDelay, TimerDuration, TimerReset, TimerStatus, TimerTriggerActivation, TimerTriggerSource
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>Timer0</i>	Timer0 is selected.
<i>Timer1</i>	Timer1 is selected.

## TimerStatus

[TimerSelector]

Displays the current status of the selected timer.

<b>Interface support</b>	All
<b>Display name</b>	Timer Status
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>TimerActive</i>	The timer is active.
<i>TimerCompleted</i>	The timer has completed.
<i>TimerDelay</i>	The timer is delayed by the period of time set for <b>TimerDelay</b> .
<i>TimerTriggerWait</i>	The timer is waiting for a trigger.

## TimerTriggerActivation

[TimerSelector]

Selects the electrical signal level of the trigger to activate the timer.

<b>Interface support</b>	All
<b>Display name</b>	Timer Trigger Activation
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

<b>Value</b>	<b>Description</b>
<i>AnyEdge</i>	The timer is triggered by a signal on any edge.
<i>FaLLingEdge</i>	The timer is triggered by a signal on the falling edge.
<i>LevelHigh</i>	The timer is triggered when signal level turns to high.
<i>LevelLow</i>	The timer is triggered when signal level turns to low.
<i>RisingEdge</i>	The timer is triggered by a signal on the rising edge.

## TimerTriggerSource

[TimerSelector]

Selects the electrical signal level of the trigger to start the selected timer.

<b>Interface support</b>	All
<b>Display name</b>	Timer Trigger Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/CounterAndTimerControl

Value	Description
<i>AcquisitionActive</i>	The timer is triggered when the acquisition starts.
<i>Action0</i> <sup>1</sup>	The timer is triggered by the Action0 command.
<i>Action1</i> <sup>1</sup>	The timer is triggered by the Action1 command.
<i>Counter0Active</i>	The timer is triggered when Counter0 is active
<i>Counter1Active</i>	The timer is triggered when Counter1 is active
<i>Counter2Active</i>	The timer is triggered when Counter2 is active
<i>ExposureActive</i> <sup>2</sup>	The timer is triggered when the exposure starts.
<i>Line0</i>	The timer is triggered by a signal on input line 0.
<i>Line1</i>	The timer is triggered by a signal on input line 1.
<i>Line2</i> <sup>3</sup>	The timer is triggered by a signal on input line 2.
<i>Line3</i> <sup>3</sup>	The timer is triggered by a signal on input line 3.
<i>Off</i>	The timer is disabled or stopped (default).
<i>SoftwareSignal0</i>	The timer is triggered by SoftwareSignal0.
<i>SoftwareSignal1</i>	The timer is triggered by SoftwareSignal1.
<i>Timer0Active</i>	The timer is triggered when Timer0 is active
<i>Timer1Active</i>	The timer is triggered when Timer1 is active

<sup>1</sup> Currently, available with Alvium GigE cameras only.

<sup>2</sup> Available for cameras with global shutter sensors and with rolling shutter sensors if **TriggerMode** is enabled or if **AcquisitionMode** is set to *Continuous*.

<sup>3</sup> Available with Alvium GigE and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

## DeviceControl

The features in this category can be used to display, such as the camera temperature and name, firmware version, transport layer, or applied standard versions for GenCP and SFNC.

Other features enable monitoring the link speed, controlling the bandwidth, and resetting the camera. Timestamp features are essential for counters and timers.

<b>Interface support</b>	All (most features)
<b>Display name</b>	Device Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## DeviceFamilyName

Displays the identifier of the product family of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Family Name
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceFirmwareID

[DeviceFirmwareIDSelector]

Displays one or a list of firmware IDs of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Firmware ID
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceFirmwareIDSelector

Selects the DeviceFirmwareID to be read after restarting the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Firmware ID Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	DeviceFirmwareID
<b>Category</b>	/DeviceControl

Values	Description
<i>Current</i>	The current firmware ID is selected to be read after the next camera restart.
<i>Supported</i>	Another than the current firmware ID is selected to be read after the next camera restart.

## DeviceFirmwareVersion

[DeviceFirmwareVersionSelector]

Displays the version of the firmware in the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Firmware Version
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl/DeviceControl

## DeviceFirmwareVersionSelector

Selects the DeviceFirmwareVersion to be read after restarting the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Firmware Version Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	DeviceFirmwareVersion
<b>Category</b>	/DeviceControl

Values	Description
<i>Current</i>	The current firmware version is selected to be read after the next camera restart.
<i>Programmed</i>	Another than the current firmware version is selected to be read after the next camera restart.

## DeviceGenCPVersionMajor

Displays the major version of the GenCP supported by the camera.

<b>Interface support</b>	CSI-2, USB
<b>Display name</b>	Device GenCP Version Major
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	DeviceGenCPVersionMinor
<b>Category</b>	/DeviceControl



## DeviceGenCPVersionMinor

Displays the minor version of the GenCP supported by the camera.

<b>Interface support</b>	CSI-2, USB
<b>Display name</b>	Device GenCP Version Minor
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	DeviceGenCPVersionMajor
<b>Category</b>	/DeviceControl

## DeviceIndicatorLuminance

Controls the luminance of the indicators (such as LEDs) showing the status of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Indicator Luminance
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Values	Description
0	Minimum
10	Maximum

## DeviceIndicatorMode

Selects the behavior of the indicators (such as LEDs) showing the status of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Indicator Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Values	Description
<i>Active</i>	The indicator is enabled.
<i>ErrorStatus</i>	The indicator signals an error status.
<i>Inactive</i>	The indicator is disabled.

## DeviceLinkCommandTimeout

Displays the command timeout of the specified link.

<b>Interface support</b>	All
<b>Display name</b>	Device Link Command Timeout
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Values	Description
0	Minimum
1,000,000,000	Maximum

## DeviceLinkSpeed

Displays the speed of transmission negotiated and represents the total speed of all the connections of the specified link.

<b>Interface support</b>	All
<b>Display name</b>	Device Link Speed
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes per second
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceLinkThroughputLimit

Controls the maximum bandwidth of the data streamed out by the camera on the selected link. Delays are uniformly inserted between transport layer packets reducing the peak bandwidth.

### Notes:

- Use this feature to adjust camera data output to the performance of your host system to avoid lost frames. Additionally, you may reduce the frame rate to reduce bandwidth.
- Maximum values can be reduced by the bandwidth of the host system.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Device Link Throughput Limit
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes per second
<b>Affected features</b>	ExposureTimeMax, ExposureTimeMin, ExposureAutoMin, ExposureAutoMax, ExposureTime, AcquisitionFrameRate
<b>Category</b>	/DeviceControl

Values Alvium G1	Description
Camera model dependent	Minimum
<i>125000000</i>	Maximum

Values Alvium G5/G5X	Description
Camera model dependent	Minimum
<i>625000000</i>	Maximum

Values Alvium 1800 U	Description
Camera model dependent	Minimum
<i>200000000</i>	Default
<i>450000000</i>	Maximum

## DeviceLinkThroughputLimitMode

Enable or disables `DeviceLinkThroughputLimit`.

When this feature is disabled, low-level transport layer (TL) specific features are expected to control the throughput.

When this feature is enabled, `DeviceLinkThroughputLimit` controls the overall throughput.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Device Link Throughput Limit Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	ExposureTimeMax, ExposureTimeMin, ExposureAutoMin, ExposureAutoMax, ExposureTime, AcquisitionFrameRate
<b>Category</b>	/DeviceControl

Values	Description
<i>Off</i>	<code>DeviceLinkThroughputLimit</code> is disabled (GigE default).
<i>On</i>	<code>DeviceLinkThroughputLimit</code> is enabled (USB default).

## DeviceManufacturerInfo

Displays the manufacturer information about the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Manufacturer Info
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceModelName

Displays the model name of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Model Name
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DevicePowerSavingMode

Selects between standard power use and various power saving modes.

<b>Interface support</b>	USB
<b>Display name</b>	Device Power Saving Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Values	Description
<i>Disabled</i>	The camera uses standard power (default).
<i>SuspendMode</i>	The camera is enabled to go into USB U3 power saving mode. <sup>1</sup>

<sup>1</sup>To apply the selected power saving mode, the host must send a `DevicePowerSave` command or a respective backend command to the camera.

## DeviceReset

Resets the camera to its power up state.

**Note:** After reset, the camera must be rediscovered.

<b>Interface support</b>	All
<b>Display name</b>	Device Reset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceSFNCVersionMajor

Displays the major version of the SFNC that was used to create the camera's GenICam XML.

<b>Interface support</b>	All
<b>Display name</b>	Device SFNC Version Major
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceSFNCVersionMinor

Displays the minor version of the SFNC that was used to create the camera's GenICam XML.

<b>Interface support</b>	All
<b>Display name</b>	Device SFNC Version Minor
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

### DeviceSFNCVersionSubMinor

Displays the sub minor version of the SFNC that was used to create the camera's GenICam XML.

<b>Interface support</b>	All
<b>Display name</b>	Device SFNC Version Sub Minor
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

### DeviceScanType

Displays the scan type of the image sensor.

<b>Interface support</b>	All
<b>Display name</b>	Device Scan Type
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Values	Description
<i>Areascan</i>	2D area readout is selected.



## DeviceSerialNumber

Displays the camera's serial number.

Displays the unique identifier of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Device Serial Number
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceStreamChannelPacketSize

Displays the stream packet size achieved on the selected channel for the transmitter or the maximum packet size supported by the receiver.

<b>Interface support</b>	GigE
<b>Display name</b>	Device Stream Channel Packet Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

<b>Value</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## DeviceTemperature

[DeviceTemperatureSelector]

Displays the camera temperature in degrees Celsius [°C], measured at the location selected by **DeviceTemperatureSelector**.

<b>Interface support</b>	All
<b>Display name</b>	Device Temperature
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Degrees Celsius
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceTemperatureSelector

Selects the location in the camera, where the temperature is to be measured.

<b>Interface support</b>	All
<b>Display name</b>	Device Temperature Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	DeviceTemperature
<b>Category</b>	/DeviceControl

Value	Description
<i>Mainboard</i>	The mainboard temperature is measured.
<i>FpgaCore<sup>1</sup></i>	The FPGA (companion board) temperature is measured.
<i>PhyCore<sup>1</sup></i>	The physical interface temperature is measured.

<sup>1</sup> Alvium G5/G5X only.

## DeviceTemperatureStatus

Displays if the camera is operated at a safe temperature.

For Alvium G1 and G5, this is output as event messages as well.

**Notes:** If the camera is often overheated, the accuracy of the sensor readout can be compromised on the long run. You can use this feature to enable a long life for your camera.

If the mainboard temperature reaches 90 °C:

1. With Alvium G1 and G5, the camera outputs the event message `EventTemperatureShutoff`.
2. The camera is shut off.

<b>Interface support</b>	All
<b>Display name</b>	Device Temperature Status
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	DeviceTemperature
<b>Category</b>	/DeviceControl

Value	Description
<i>OK</i>	Mainboard temperature: $\leq 75$ °C Event message with Alvium G1 and G5: <code>EventTemperatureOK</code> . User actions: No actions are required.
<i>Warning</i>	Mainboard temperature: $> 75$ °C. Event message with Alvium G1 and G5: <code>EventTemperatureWarning</code> . User actions: We recommend you to take actions to cool down the camera. If the temperature increases even more, the camera will be shut down completely.
<i>Overtemperature</i>	The mainboard temperature exceeds the maximum value allowed in the model specifications. Event message with Alvium G1 and G5: <code>EventTemperatureOvertemperature</code> . The sensor is shut down and the camera does not output images, but you can read out and write settings that do not require the sensor. User actions: We recommend you to ensure adequate cooling for the camera before you restart it.

## DeviceTLVersionMajor

Displays the major version of the camera's transport layer.

<b>Interface support</b>	All
<b>Display name</b>	Device Transport Layer Version Major
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Value	Description
0	Minimum
4294967295	Maximum

## DeviceTLVersionMinor

Displays the minor version of the camera transport layer.

<b>Interface support</b>	All
<b>Display name</b>	Device Transport Layer Version Minor
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Value	Description
0	Minimum
4294967295	Maximum

## DeviceUserID

Controls the user-programmable camera identifier.

**Note:** Maximum 63 characters are allowed.

<b>Interface support</b>	All
<b>Display name</b>	Device User ID
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceVendorName

Displays the name of the camera manufacturer.

<b>Interface support</b>	All
<b>Display name</b>	Device Vendor Name
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## DeviceVersion

Displays the camera's product code.

<b>Interface support</b>	All
<b>Display name</b>	Device Version
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

## TimestampLatch

Latches the current timestamp counter into `TimestampLatchValue`.

<b>Interface support</b>	All
<b>Display name</b>	Time Stamp Latch
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	TimestampLatchValue
<b>Category</b>	/DeviceControl

## TimestampLatchValue

Displays the latched value of the timestamp counter.

<b>Interface support</b>	All
<b>Display name</b>	Timestamp Latch Value
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DeviceControl

Value	Description
0	Minimum
9223372036854775807	Maximum

## TimestampReset

Resets the current value of the timestamp counter.

**Note:** After executing this command, the timestamp counter restarts automatically.

<b>Interface support</b>	All
<b>Display name</b>	Timestamp Reset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	TimestampLatchValue
<b>Category</b>	/DeviceControl

## DigitalIOControl

The features in this category can be used to control the physical input and output lines of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Digital IO Control Info
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## LineDebounceDuration

Controls the time constant for **LineDebounceMode**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Line Debounce Duration
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Unit</b>	Microseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl

Values	Description
<i>0.0193236715</i>	Minimum
<i>39.5748792271</i>	Maximum



## LineDebounceMode

Controls the Line Debouncing feature for a particular input line.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Line Debounce Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LineDebounceDuration
<b>Category</b>	/DigitalIOControl

Values	Description
<i>DeLay</i>	LineDebounceDuration controls how long the signal level must be sustained for before it is accepted.
<i>Off</i>	The feature is disabled (default).
<i>Stall</i>	LineDebounceDuration controls the intensity duration after the falling edge of the signal.

## LineInverter

[LineSelector]

Enables or disables the inversion of the signal of the selected input or output line.

<b>Interface support</b>	All
<b>Display name</b>	Line Inverter
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl

Values	Description
<i>False</i>	Signal of the input or output line is not inverted.
<i>True</i>	Signal of the input or output line is inverted.

## LineMode

[LineSelector]

Selects the physical line to be used to input or output a signal.

<b>Interface support</b>	All
<b>Display name</b>	Line Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	TriggerSource, LineInverter, LineSource
<b>Category</b>	/DigitalIOControl

Values	Description
<i>Input</i>	The physical line is used for signal input.
<i>Output</i>	The physical line is used for signal output.

## LineSelector

Selects the physical line (or pin) of the external camera connector or the virtual line of the transport layer to configure.

<b>Interface support</b>	All
<b>Display name</b>	Line Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LineMode, LineSource, LineInverter, LineStatus, LineStatusAll
<b>Category</b>	/DigitalIOControl

Values	Description
<i>Line0</i>	Line 0 is selected for configuration.
<i>Line1</i>	Line 1 is selected for configuration.
<i>Line2</i>	Line 2 is selected for configuration.
<i>Line3</i>	Line 3 is selected for configuration.

## LineSource

[LineSelector]

Sets the output signal for the selected line.

**Note:** LineMode must be set to *Output*.

<b>Interface support</b>	All
<b>Display name</b>	Line Source
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl

Values	Description
<i>AcquisitionActive</i>	The <i>AcquisitionActive</i> signal is output.
<i>Action0</i> <sup>1</sup>	The Action0 command is output.
<i>Action1</i> <sup>1</sup>	The Action1 command is output.
<i>Counter0Active</i>	The <i>Counter0Active</i> signal is output.
...	...
<i>Counter3Active</i>	The <i>Counter3Active</i> signal is output.
<i>ExposureActive</i> <sup>2</sup>	The <i>ExposureActive</i> signal is output.
<i>FrameTriggerWait</i>	The <i>FrameTriggerWait</i> signal is output.
<i>Line0Signal</i>	The <i>Line0Signal</i> signal is output.
...	...
<i>Line3Signal</i> <sup>3</sup>	The <i>Line3Signal</i> signal is output.
<i>PpsSignal</i>	The PpsSignal of the pulse is output. You can use this signal to verify that the devices' clocks are synchronized sufficiently for PTP.
<i>Off</i>	No signal is output.
<i>Stream0TransferActive</i>	The <i>Stream0TransferActive</i> signal is output.
<i>Timer0Active</i>	The <i>Timer0Active</i> signal is output.
<i>Timer1Active</i>	The <i>Timer1Active</i> signal is output.

<sup>1</sup> Currently, available with Alvium GigE cameras only.

<sup>2</sup> Available for cameras with global shutter sensors and with rolling shutter sensors if **TriggerMode** is enabled or if **AcquisitionMode** is set to *Continuous*.

<sup>3</sup> Available with Alvium GigE and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

## LineStatus

[LineSelector]

Displays the current status of the selected input or output line.

<b>Interface support</b>	All
<b>Display name</b>	Line Status
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl
Values	Description
<i>False</i>	Line status is disabled.
<i>True</i>	Line status is enabled.

## LineStatusAll

Displays the current status of every input or output line in a sequence from Line0 to LineN in a single bitfield.

<b>Interface support</b>	All
<b>Display name</b>	Line Status All
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl
Values	Description
<i>0</i>	Minimum
<i>15</i>	Maximum

## SerialHubEnable

Enables or disables the serial port (UART).

**Note:** When this features is enabled, the corresponding lines become Rx and Tx. Therefore, the user application can't control these lines then.

<b>Interface support</b>	All
<b>Display name</b>	Serial Hub Enable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	LineInverter, LineMode, LineSource
<b>Category</b>	/DigitalIOControl

Values	Description
<i>True</i>	The serial port is enabled.
<i>False</i>	The serial port is disabled (default).

### Available lines

For Alvium GigE cameras and for Alvium USB cameras, 2 lines can be used as serial ports while 2 lines can be accessed by the user application at the same time.

For Alvium CSI-2 camera, 2 lines can be used as serial ports while the remaining 2 lines are reserved for I2C traffic.:

UART signal	CSI-2 Lines	GigE lines	USB lines
UART Tx	Line2	Line0	Line2
UART Rx	Line3	Line1	Line3

*Table 6: I/O lines available for serial ports by Alvium series*

### Changing between enabled and disabled serial ports

Previous line settings are not stored. You must reconfigure the corresponding lines if you want to change between use as serial ports and access by the user application.

## SerialHub (subcategory)

The features in this subcategory enable using the I/Os by UART for serial port.

<b>Interface support</b>	All
<b>Display name</b>	Serial Hub
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Subcategory
<b>Category</b>	/DigitalIOControl

## SerialBaudRate

Selects the baud rate of the UART port.

<b>Interface support</b>	All
<b>Display name</b>	Uart Baud Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Unit</b>	Baud = Bps (Bits per second)
<b>Affected features</b>	LineMode, LineInverter, LineSource
<b>Category</b>	/DigitalIOControl/SerialHub

<b>Values</b>	<b>Description</b>
<i>Baud_9600</i>	9600 Baud is selected.
<i>Baud_115200</i>	115200 Baud is selected.
<i>Baud_230400</i>	230400 Baud is selected.

## SerialParityBit

Selects the Parity Bit at the end of UART frames.

<b>Interface support</b>	All
<b>Display name</b>	Serial Parity Bit
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Unit</b>	Baud = Bps (Bits per second)
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
<i>Even</i>	The number of 1 bits in frame is even.
<i>Mark</i>	The parity bit is always set to 1.
<i>None</i>	No parity bit is in the frame.
<i>Odd</i>	The number of 1 bits in frame is odd.
<i>Space</i>	The parity bit is always set to 0.

## SerialRxData

Displays the data to be fetched from the Rx queue.

<b>Interface support</b>	All
<b>Display name</b>	Serial Rx Data
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Raw
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

## SerialRxSize

Controls the number of bytes inserted from the Rx queue.

<b>Interface support</b>	All
<b>Display name</b>	Serial Rx Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
1	Minimum
4	Default
128	Maximum

## SerialRxWaiting

Displays the number of bytes from the Rx queue waiting to be received.

<b>Interface support</b>	All
<b>Display name</b>	Serial Rx Waiting
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
0	Minimum
128	Maximum



## SerialStopBits

Controls the number of stop bits at the end of UART frames.

<b>Interface support</b>	All
<b>Display name</b>	Serial Stop Bits
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
1	Minimum (default)
2	Maximum

## SerialTxData

Controls the data that will be transmitted to the TX queue of the serial interface.

<b>Interface support</b>	All
<b>Display name</b>	Serial Tx Data
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Raw
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

## SerialTxLock

Locks or unlocks the transmission from the Tx queue.

When unlocked, the Tx queue is immediately sent over the serial port.

<b>Interface support</b>	All
<b>Display name</b>	Serial Tx Lock
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub
Values	Description
<i>True</i>	The transmission from the Tx queue is locked.
<i>False</i>	The transmission from the Tx queue is unlocked (default).

## SerialTxRemaining

Displays the number bytes from the Tx queue that remain free.

<b>Interface support</b>	All
<b>Display name</b>	Serial Tx Remaining
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
0	Minimum
128	Maximum

## SerialTxSize

Controls the number of bytes from the Tx data to be inserted into the Tx queue.

<b>Interface support</b>	All
<b>Display name</b>	Serial Tx Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/DigitalIOControl/SerialHub

Values	Description
1	Minimum
4	Default
128	Maximum

## EventControl

**Note:** Features in this category have **beta status**. The functionality has not been fully validated. Therefore, we ask you to be cautious when using event features for your application. Please share your experience with us to improve these features.

The features in this category can be used to generate messages that are sent to the host application for notifying internal camera events.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Control
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## Functional overview

1. *EventSelector* selects the event message to be configured by *EventNotification*.  
See [EventSelector](#) on page 192.
2. *EventNotification* enables the event message to be sent to the host.  
See [EventNotification](#) on page 192.

## Output for event message

- As **data packets** sent from the camera to the host.
- Vimba Viewer's **Event Viewer** continually displays all current events and related timestamps.
- Features in *EventsData* display the event identifier of the related feature and the start timestamp in Vimba Viewer's **Controller Window**:

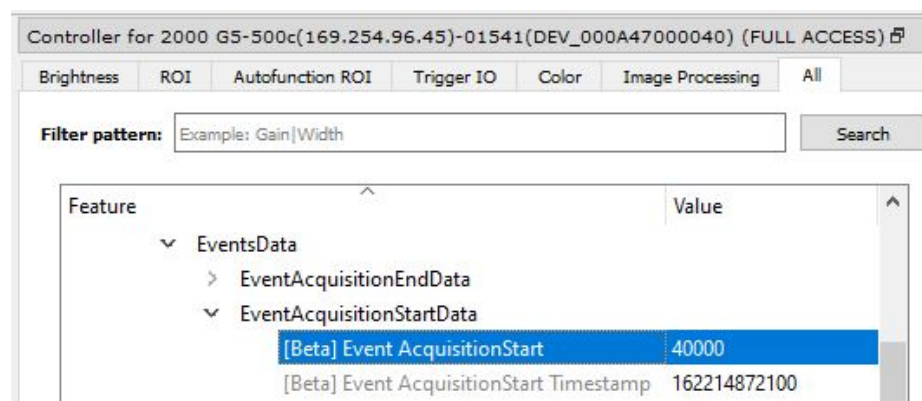


Figure 7: Value display for EventsData features in the Controller Window

See [EventsData \(subcategory\)](#) on page 189.

## EventsData (subcategory)

The features in this subcategory can be used to display event messages.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Events Data
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/EventControl



### EventsData feature descriptions

EventsData features are structured like this: Each subcategory contains a feature for the event itself and another feature for the event's timestamp, for example, `EventExposureStart` and `EventExposureStartTimestamp`. To ease reading, only the features for the event itself are listed in [Table 7](#) below.

Events are described in the value table for [EventSelector](#) on page 192.

[Feature structure: \[Event-Name\]Data \(2nd subcategory\)](#) on page 190 describes the feature structure.

[Example: EventAcquisitionEndData \(2nd subcategory\)](#) on page 191 is an example.

EventAcquisitionEnd	EventLine<0...3>FallingEdge
EventAcquisitionStart	EventLine<0...3>RisingEdge
EventAction<0...1>	EventOverflow
EventActionLate	EventSequencerSetChange
EventCounter<0...3>End	EventSoftwareSignal<0...1>
EventCounter<0...3>Start	EventTemperatureOK*
EventFrameTriggerWait	EventTemperatureOvertemperature*
EventLine<0...3>FallingEdge	EventTemperatureShutOff*
EventLine<0...3>RisingEdge	EventTemperatureWarning*
EventExposureEnd	EventTest
EventExposureStart	EventTimer<0...1>End
EventFrameTrigger	EventTimer<0...1>Start
EventFrameTriggerWait	

\* See [DeviceTemperatureStatus](#) on page 171.

*Table 7: Available events by Event-Name*

## Feature structure: [Event-Name]Data (2nd subcategory)

The features in this subcategory can be used to display event messages for [Event-Name].

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	[Event-Name] Data
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/EventControl/EventsData

## [Event-Name]

Displays the unique Identifier of the [Event-Name] event.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	[Event-Name]
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/EventControl/EventsData/[Event-Name]Data

## [Event-Name]Timestamp

Displays the timestamp of the latest [Event-Name] event.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	[Event-Name] Timestamp
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Unit</b>	Ticks = Nanoseconds
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/EventControl/EventsData/[Event-Name]Data

### Example: EventAcquisitionEndData (2nd subcategory)

The features in this subcategory can be used to display event messages for *AcquisitionEnd*.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Acquisition End Data
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/EventControl/EventsData

### EventAcquisitionEnd

Displays the unique Identifier of the *AcquisitionEnd* event.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Acquisition End
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/EventControl/EventsData/EventAcquisitionEndData

### EventAcquisitionEndTimestamp

Displays the timestamp of the latest *AcquisitionEnd* event.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Acquisition End Timestamp
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Unit</b>	Ticks = Nanoseconds
<b>Affected features</b>	Not applicable
<b>Category</b>	/EventControl/EventsData/EventAcquisitionEndData

## EventControl (category continued)

The feature descriptions for the `/EventControl/EventsData` subcategory have ended on the previous page. The following features continue the `/EventControl` category, without a subcategory.

### EventNotification

[EventSelector]

Enables or disables the selected event message to be sent to the host.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Notification
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/EventControl
Values	Description
<i>Off</i>	The selected event message is <b>not</b> sent to the host.
<i>On</i>	The selected event is sent to the host.

### EventSelector

Selects which event message to configure with `EventNotification`.

<b>Interface support</b>	GigE <b>(Beta)</b>
<b>Display name</b>	Event Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	EventNotification
<b>Category</b>	/EventControl

Values	Description for selected values
<i>AcquisitionEnd</i>	The camera just completed the acquisition.
<i>AcquisitionStart</i>	The camera just started the acquisition.

Table 8: EventSelector value descriptions (sheet 1 of 2)



Values	Description for selected values
<i>Action&lt;0...1&gt;</i>	The camera just executed Action<0...1>.
<i>ActionLate</i>	The camera just missed to execute an action command in time.
<i>Counter&lt;0...3&gt;End</i>	Counter<0...3> has just ended.
<i>Counter&lt;0...3&gt;Start</i>	Counter<0...3> was just started.
<i>ExposureEnd</i>	The exposure has just ended.
<i>ExposureStart</i>	The exposure just has been started.
<i>FrameTrigger</i>	A frame trigger just has been executed.
<i>FrameTriggerWait</i>	The camera is currently waiting for a frame trigger.
<i>Line&lt;0...3&gt;FallInEdge</i>	The camera has just received the falling edge of a signal on I/O Line<0...3>.
<i>Line&lt;0...3&gt;RisingEdge</i>	The camera has just received the rising edge of a signal on I/O Line<0...3>.
<i>Overflow</i>	Event data is currently overflowing the camera internal memory.
<i>SequencerSetChange</i>	The change of the sequencer set has just become active on the camera.
<i>SoftwareSignal&lt;0...1&gt;</i>	The camera has just received a signal on SoftwareSignal<0...1>.
<i>TemperatureOK*</i>	The camera temperature is currently low enough to allow full operation.
<i>TemperatureOvertemperature*</i>	The camera's mainboard temperature has just reached a critical value. The camera is going to be shut down next.
<i>TemperatureShutOff*</i>	The camera has just been shut off because the maximum temperature has been reached that is allowed by the specifications.
<i>TemperatureWarning*</i>	The camera's mainboard temperature is currently increasing towards the maximum value allowed by the specifications. You should cool the camera.
<i>Test</i>	The camera has just received a the <b>TestEventGenerate</b> command.
<i>Timer&lt;0...1&gt;End</i>	Timer<0...1> has just ended.
<i>Timer&lt;0...1&gt;Start</i>	Timer<0...1> has just been started.

\* See [DeviceTemperatureStatus](#) on page 171.

Table 8: EventSelector value descriptions (sheet 2 of 2)

## FileAccessControl

The features in this category enable to read from and write files to the camera, including such as firmware, user data, or datasets for DPC (Defect pixel correction) and FPNC (Fixed pattern noise correction).

<b>Interface support</b>	All
<b>Display name</b>	File Access Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## FileAccessBuffer

Displays the intermediate access buffer that allows the exchange of data between the camera file storage and the application.

<b>Interface support</b>	All
<b>Display name</b>	File Access Buffer
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Register
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

## FileAccessLength

Displays the length of the mapping between the camera file storage and FileAccessBuffer.

<b>Interface support</b>	All
<b>Display name</b>	File Access Length
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Register
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

## FileAccessOffset

Displays the offset of the mapping between the camera file storage and the FileAccessBuffer.

<b>Interface support</b>	All
<b>Display name</b>	File Access Offset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

## FileOpenMode

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

<b>Interface support</b>	All
<b>Display name</b>	File Open Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

Values	Description
<i>Read</i>	Read access is enabled.
<i>Write</i>	Write access is enabled.

## FileOperationExecute

Executes the operation selected by `FileOperationSelector` on the selected file.

<b>Interface support</b>	All
<b>Display name</b>	File Operation Execute
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	FileAccessBuffer, FileAccessOffset, FileAccessLength, FileOperationStatus, FileOperationResult, FileSize
<b>Category</b>	/FileAccessControl

## FileOperationResult

[FileSelector][FileOperationSelector]

Displays the file operation result. For read or write operations, the number of successfully read or written bytes is returned.

<b>Interface support</b>	All
<b>Display name</b>	File Operation Result
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

## FileOperationSelector

[FileSelector]

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



### Damage to the defect pixel correction data set

If you select `DefectPixelCorrectionPreset` for `FileSelector`, you also have write access. This way, the DPC correction data from manufacturing can be overwritten.

Before you write to this data set, read and save the data to an external source for recovery!

<b>Interface support</b>	All
<b>Display name</b>	File Operation Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	FileOperationExecute, FileAccessBuffer, FileAccessOffset, FileAccessLength, FileOperationStatus, FileOperationResult, FileSize
<b>Category</b>	/FileAccessControl

Values	Description
<i>Close</i>	The selected file s closed.
<i>Delete</i>	The selected file is deleted.
<i>Open</i>	The selected file is opened.
<i>Read</i>	The selected file is read from.
<i>Write</i>	The selected file is written to.

## FileOperationStatus

[FileSelector][FileOperationSelector]

Displays the file operation execution status.

<b>Interface support</b>	All
<b>Display name</b>	File Operation Status
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

Values	Description
<i>Failure</i>	File operation failed.
<i>Success</i>	File operation was successful (default).

## FileProcessStatus

[FileSelector]

Displays an additional process status.

<b>Interface support</b>	All
<b>Display name</b>	File Process Status
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

Values	Description
<i>None</i>	No extended status (default).
<i>UpdateNotRequired</i>	No file operation is required, because flash and file content are identical.

## FileSelector

Selects the target file in the camera.



### Damage to the defect pixel correction data set

If you select *DefectPixelCorrectionPreset* for *FileSelector*, you also have write access. This way, the DPC correction data from manufacturing can be overwritten.

Before you write to this data set, read and save the data to an external source for recovery!

<b>Interface support</b>	All
<b>Display name</b>	File Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	FileStatus, FileSize, FileOpenMode, FileOperationSelector, FileOperationExecute, FileAccessBuffer, FileAccessOffset, FileAccessLength, FileOperationStatus, FileOperationResult
<b>Category</b>	/FileAccessControl

Values	Description
<i>DefectPixelCorrectionPreset</i>	The preset for defect pixel correction (DPC) is target for file operations.
<i>DefectPixelCorrectionUser</i>	User defined defect pixel correction (DPC) is target for file operations.
<i>Firmware</i>	Firmware is target for file operations.
<i>FixedPatternNoiseCorrectionPreset</i>	The preset for fixed pattern noise correction (FPNC) is target for file operations.
<i>FixedPatternNoiseCorrectionUser</i>	User defined fixed pattern noise correction (FPNC) user set is target for file operations.
<i>UserData</i>	User data is target for file operations.
<i>UserSet1</i>	UserSet1 target for file operations.
<i>UserSet2</i>	UserSet2 target for file operations.
<i>UserSet3</i>	UserSet3 target for file operations.
<i>UserSet4</i>	UserSet4 target for file operations.

## FileSize

[FileSelector]

Displays the size of the selected file in bytes.

<b>Interface support</b>	All
<b>Display name</b>	File Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

## FileStatus

[FileSelector]

Displays the status of the selected file.

<b>Interface support</b>	All
<b>Display name</b>	File Status
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/FileAccessControl

Values	Description
<i>Closed</i>	The selected file is currently closed (default).
<i>Open</i>	The selected file is currently open.



## ImageFormatControl

The features in this category can be used to control pixel related data, including binning and ROI (region of interest), and reverse image. **PixelFormat** and **PixelSize** enable selecting between different modes for Date of document release and color pixel readout.

**SensorBitDepth** can be used to control the bandwidth by different sensor readout modes (ADC).

When set to *GlobalResetReleaseShutter*, sensor lines are integrated simultaneously for selected rolling shutter sensors with **ShutterMode**.

<b>Interface support</b>	All (most features)
<b>Display name</b>	Image Format Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## Observe with binning features

Only digital binning or sensor binning can be used at a time.

You must revert binning values to 1 before you can switch between these binning modes.

### BinningHorizontal

Controls the number of horizontal pixels combined into one. This reduces the horizontal resolution (width) of the image.

#### Notes:

- For Alvim models  $\geq 12$  MP resolution, if **BinningVertical** is used, **BinningHorizontal** is set to 2.
- With sensor binning, maximum values depend on the camera model.

<b>Interface support</b>	All
<b>Display name</b>	Binning Horizontal
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	WidthMax
<b>Category</b>	/ImageFormatControl

Values	Description
1	Minimum
8	Maximum (with digital binning)

## BinningHorizontalMode

Determines whether the result of binned pixels is averaged or summed up.

### Notes:

- Changing `BinningHorizontalMode` sets `BinningVerticalMode` to the same value.
- **Digital binning:** All Alvium models support *Sum*, and *Average*.
- **Sensor binning:** All Alvium models with sensor binning support *Sum*, some models support *Average* in addition.

<b>Interface support</b>	All
<b>Display name</b>	Binning Horizontal Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate, BinningHorizontal, BinningVertical, BinningVerticalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax
<b>Category</b>	/ImageFormatControl

Values	Description
<i>Average</i>	The charge or gray value of adjacent pixels is averaged.
<i>Sum</i>	The charge or gray value of adjacent pixels is summed up.

## BinningSelector

Selects which binning engine is controlled by `BinningHorizontal` and `BinningVertical`.

**Note:** Only digital binning or sensor binning can be used at a time.

<b>Interface support</b>	All
<b>Display name</b>	Binning Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate, BinningHorizontal, BinningHorizontalMode, BinningVertical, BinningVerticalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax
<b>Category</b>	/ImageFormatControl

Values	Description
<i>Digital</i>	Digital binning is used (default).
<i>Sensor*</i>	Sensor binning is used.

\* Availability only for selected models.

## BinningVertical

Controls the number of vertical pixels combined into one. This reduces the vertical resolution (height) of the image.

**Note:** With sensor binning, maximum values depend on the camera model.

<b>Interface support</b>	All
<b>Display name</b>	Binning Vertical
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AcquisitionFrameRate, BinningHorizontal, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax
<b>Category</b>	/ImageFormatControl

Values	Description
1	Minimum
8	Maximum (with digital binning)

## BinningVerticalMode

Determines whether the result of binned pixels is averaged or summed up.

### Note:

- Changing `BinningVerticalMode` sets `BinningHorizontalMode` to the same value.
- **Digital binning:** All Alvium models support *Sum*, and *Average*.
- **Sensor binning:** All Alvium models with sensor binning support *Sum*, some models support *Average* in addition.

<b>Interface support</b>	All
<b>Display name</b>	Binning Vertical Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate, BinningHorizontal, BinningVertical, BinningHorizontalMode, DeviceLinkThroughputLimit, ExposureAutoMax, ExposureAutoMin, ExposureTime, HeightMax, WidthMax
<b>Category</b>	/ImageFormatControl

Values	Description
<i>Average</i>	The charge or gray value of adjacent pixels is averaged.
<i>Sum</i>	The charge or gray value of adjacent pixels is summed up.

## Height

Controls the image height output by the camera.

<b>Interface support</b>	All
<b>Display name</b>	Height
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	OffsetY, AutoModeRegionOffsetY, AutoModeRegionHeight, AcquisitionFrameRate, PayloadSize
<b>Category</b>	/ImageFormatControl

## HeightMax

Displays the available maximum image height.

**Note:** This dimension is calculated after vertical binning or any other function changing the vertical dimension of the image.

<b>Interface support</b>	All
<b>Display name</b>	Height Max
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixel
<b>Affected features</b>	Height, OffsetY
<b>Category</b>	/ImageFormatControl

## OffsetX

Controls the horizontal offset from the origin to the ROI.

<b>Interface support</b>	All
<b>Display name</b>	Offset X
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionOffsetX, AutoModeRegionWidth
<b>Category</b>	/ImageFormatControl

Values	Description
0	Minimum

## OffsetY

Controls the vertical offset from the origin to the ROI.

<b>Interface support</b>	All
<b>Display name</b>	Offset Y
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	AutoModeRegionOffsetY, AutoModeRegionHeight
<b>Category</b>	/ImageFormatControl

Values	Description
0	Minimum

## PixelFormat

Selects the pixel format output by the camera.

**Note:** The feature represents all the information provided by **PixelCoding**, **PixelSize**, and **PixelColorFilter** combined in a single feature.

<b>Interface support</b>	All
<b>Display name</b>	Pixel Format
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	DeviceLinkThroughputLimit, PayloadSize, PixelSize, BlackLevel, ContrastEnable, ContrastDarkLimit, ContrastBrightLimit, BlackLevel, Hue, Saturation, ColorTransformationEnable, ColorTransformationValue, HeightMax, WidthMax
<b>Category</b>	/ImageFormatControl



## PixelSize

Displays the total size of a pixel of the image as Bits per pixel (Bpp).

<b>Interface support</b>	All
<b>Display name</b>	Pixel Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Unit</b>	Bits
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageFormatControl

## ReverseX

Enables or disables to flip the image horizontally.

**Note:** The ROI is applied after the flipping.

<b>Interface support</b>	All
<b>Display name</b>	Reverse X
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Width, WidthMax (color cameras)
<b>Category</b>	/ImageFormatControl

Values	Description
<i>False</i>	Image is not flipped horizontally.
<i>True</i>	Image is flipped horizontally.

## ReverseY

Enables or disables to flip the image vertically.

**Note:** The ROI is applied after the flipping.

<b>Interface support</b>	All
<b>Display name</b>	Reverse Y
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Height, HeightMax (color cameras)
<b>Category</b>	/ImageFormatControl
Values	Description
<i>False</i>	Image is not flipped vertically.
<i>True</i>	Image is flipped vertically.

## SensorBitDepth

Selects the readout mode of the camera sensor.

If you are using pixel formats that do not require 12-bit readout and you want to achieve higher frame rates, you can select between readout modes for 12-bit, 10-bit, and 8-bit.

### Notes

- The sensor ADC bit depth is the default value.
- In the *Adaptive* mode, the bit depth is switched between 10-bit and 12-bit automatically, depending on the selected pixel format and limitations of sensor and camera.

<b>Interface support</b>	All
<b>Display name</b>	Sensor Bit Depth
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Unit</b>	Bits
<b>Affected features</b>	AcquisitionFrameRate, DeviceLinkThroughputLimit, ExposureActiveMode, ExposureAuto, ExposureAutoMax, ExposureAutoMin, ExposureMode, ExposureTime
<b>Category</b>	/ImageFormatControl

Values <sup>1</sup>	Description
<i>Adaptive</i>	The sensor bit depth is switched automatically between 12-bit and 10-bit readout, depending on the pixel format. (Default value for all camera models.)
<i>Bpp8</i>	The sensor bit depth is set to 8-bit, if supported by the sensor.
<i>Bpp10</i>	The sensor bit depth is set to 10-bit, if supported by the sensor.
<i>Bpp12</i>	The sensor bit depth is set to 12-bit if the camera sensor supports 12-bit readout mode.

<sup>1</sup>Camera model dependent

## SensorHeight

Displays the effective sensor height.

<b>Interface support</b>	All
<b>Display name</b>	Sensor Height
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixel
<b>Affected features</b>	HeightMax
<b>Category</b>	/ImageFormatControl

## SensorWidth

Displays the effective sensor width.

<b>Interface support</b>	All
<b>Display name</b>	Sensor Width
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixel
<b>Affected features</b>	WidthMax
<b>Category</b>	/ImageFormatControl

## MultipleRegionControl (subcategory)

This subcategory holds the features to configure and control the multiple regions of the camera.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Multiple Region Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/ImageFormatControl

## Functional overview

Multiple region features can be used to assign different image settings to sections of an image, or to exclude irrelevant contents from the image output. In some cases, frame rates can be increased as well.



### Availability by model

You can find the feature availability for your Alvium model in the feature specifications of your camera's user guide at [www.alliedvision.com/en/support/technical-documentation](http://www.alliedvision.com/en/support/technical-documentation).

## Features available with multiple regions

The following features for image control can be adjusted separately:

- Hue
- BalanceRatioBlue
- BalanceRatioRed
- ColorTransformationEnable
- ColorTransformationValue
- ContrastBrightLimit
- ContrastDarkLimit
- ContrastEnable
- ContrastShape
- Gamma
- Hue
- Saturation

## Features disabled by multiple regions

The following features are disabled when multiple regions are used:

- ReverseX
- ReverseY
- Binning features

Multiple regions cannot be configured when these features are enabled.

## Multiple region arrangement

`SubRegionSelector` is set to `Region0` by default for all camera models. For cameras that support only single ROI, no other regions or multiple region features are available. Selected Alvim models support 4 regions.

### Free mode

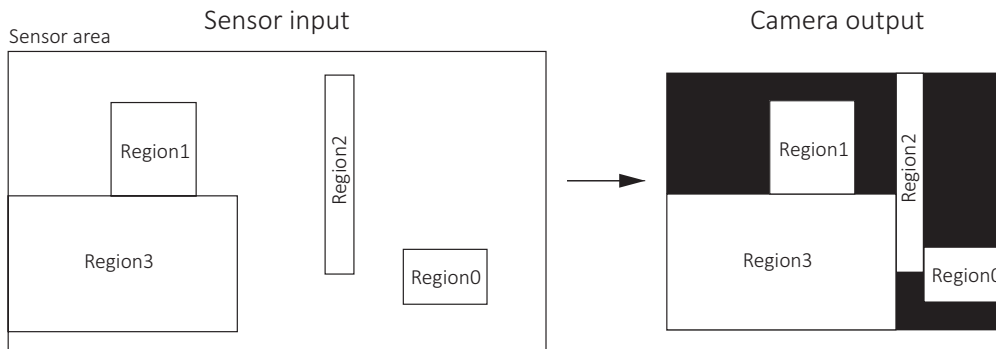


Figure 8: Free mode - sensor input vs. camera output

### Tile mode

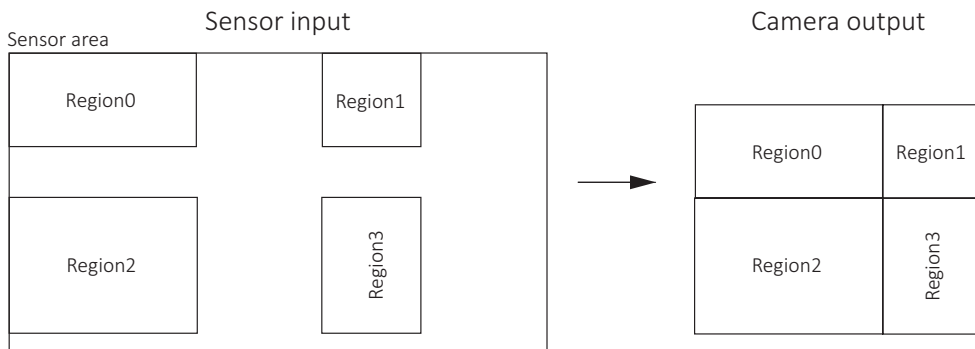


Figure 9: Tile mode - sensor input vs. camera output

### Horizontal mode

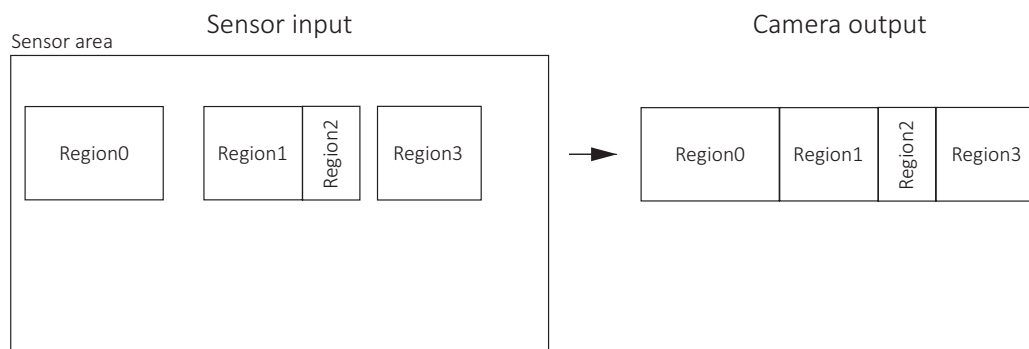


Figure 10: Horizontal mode - sensor input vs. camera output

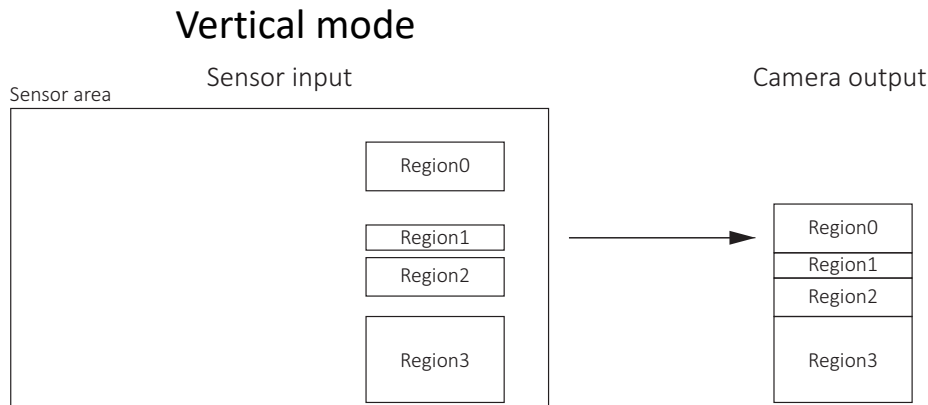


Figure 11: Vertical mode - sensor input vs. camera output

## Rules for region ID numbers

Generally, the IDs for `SubRegionSelector` must be assigned continuously, ascending from **Region0**, to output the selected regions completely.

In *Tile* mode, if an ID is missing in a line or column space, the following regions are omitted, as shown in the top example of [Figure 12](#) where **Region1** and **Region2** have been disabled.

In the example below, **Region0** and **Region2** do not have continuous IDs, but they share a common line space. Therefore, the selected regions are output completely.

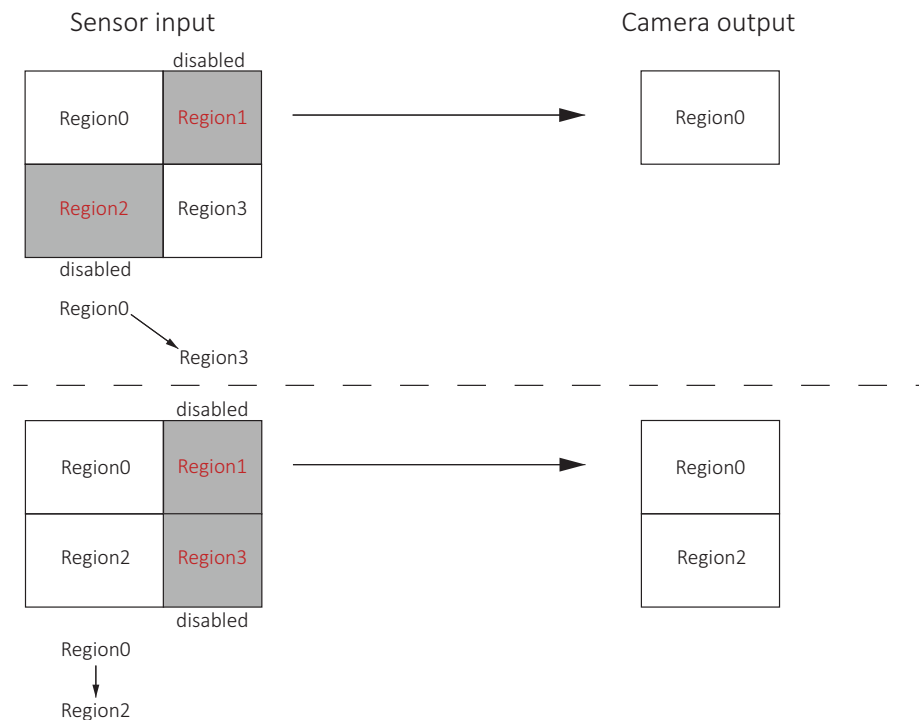


Figure 12: Tile mode - missing Region1

In *Horizontal* and *Vertical* mode, the values for `SubRegionSelector` must be assigned continuously. If an ID is missing, the following regions are omitted, as shown in the top example of [Figure 13](#) where *Region1* has been disabled. In the example below, the regions have been reassigned for *Region1* and *Region2*. The selected regions are output completely.

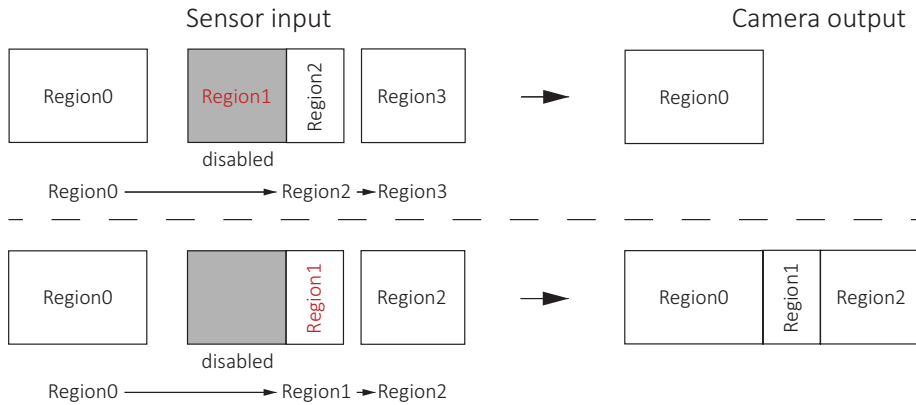


Figure 13: Horizontal mode - missing Region1

## Region arrangement modes data at a glance

[Table 9](#) shows ranges for `MultipleRegionArrangement` modes.

Arrangement mode	Availability <sup>1</sup>	Number of regions <sup>2</sup>	Position	Subregion ID order	Pixel gaps
Free mode <sup>3</sup>	All	1 to 4	Free	Free	Yes
Tile	All		Common values for <code>SubRegionOffsetX</code> and <code>SubRegionWidth</code> with regions arranged one above another	See <a href="#">Figure 9</a> , <a href="#">Figure 12</a>	
			Common values for <code>SubRegionOffsetY</code> and <code>SubRegionHeight</code> with regions arranged next to one another		
Horizontal	Some cameras		Common values for <code>SubRegionOffsetY</code> and <code>SubRegionHeight</code>	Left to right	
Vertical	Some cameras	Common values for <code>SubRegionOffsetX</code> and <code>SubRegionWidth</code>	Top to bottom		

<sup>1</sup> For cameras that support multiple regions  
<sup>2</sup> Regions must not overlap  
<sup>3</sup> Default

Table 9: Ranges for `MultipleRegionArrangement` modes



## Values for width, height, and offsets

When multiple regions are enabled, feature values are:

- **Width** = Number of horizontal pixels of the **output image**
- **Height** = Number of vertical pixels of the **output image**
- **OffsetX** = Horizontal offset from the top left corner of the **sensor image**
- **OffsetY** = Vertical offset from the top left corner of the **sensor image**

## Single ROI and AutoModeControl

Multiple regions are part of the functional family for regions cropped out of the full sensor image. The following section describes the relation between these functions.

### Single ROI

Multiple regions can be set while the camera is operated in single ROI mode. Changes become effective when **MultipleRegionEnable** is set to **True**.

When **Region0** is activated in multiple regions for the first time, the feature values for the active single ROI (or the full sensor image) are taken over. When features for **Region0** have been adjusted separately and multiple regions are disabled, the last values for **Region0** are applied for the single ROI (or the full sensor image).



#### Switching between ROI modes

We recommend you not to switch between single ROI and multiple ROI.

### Auto mode regions

Auto mode regions equal single ROI (or the full sensor image) by default. Size and position of auto mode regions can be adjusted to subsets. See [Regions of interest and auto mode regions](#) on page 32.

When multiple regions are enabled, auto mode regions are automatically adjusted to match **Region0**. Therefore, when **Region0** is adjusted, an active auto mode region is adjusted simultaneously. Afterwards, auto mode regions can be adjusted, but only as a subset of **Region0**.

When multiple regions are disabled, size and position for **Region0** is applied for the auto mode regions.

## MultipleRegionArrangement

Selects the position of the separate ROIs in the merged image.

**Note:** ROIs cannot overlap.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Multiple Region Arrangement
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Height, OffsetX, OffsetY, Width
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

<b>Values</b>	<b>Description</b>
<i>Tile</i>	Selects 2 to 4 regions that add to a common rectangle without gaps.
<i>Horizontal</i>	Selects 2 to 4 regions next to each other that add to a common rectangle without gaps.
<i>Vertical</i>	Selects 2 to 4 regions above each other that add to a common rectangle without gaps.
<i>Free</i>	Selects 2 to 4 regions in free arrangement, allowing gaps (default).

## MultipleRegionEnable

Selects between single region and multiple regions mode. The number of subregions to be configured depends on the camera model.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Multiple Region Enable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Height, OffsetX, OffsetY, Width
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
<i>False</i>	Single region mode is enabled, subregions mode is disabled ( <b>default</b> ). Height, OffsetX, OffsetY, and Width be used as usual.
<i>True</i>	Subregions mode is enabled. Height, OffsetX, OffsetY, and Width features are locked and are automatically aligned with the values set for subregions.

## SubRegionHeight

[SubRegionSelector]

Height of the selected subregion.

**Note:** If values are entered that are not dividable by 8, **SubRegionHeight** is increased automatically to the next higher available value. For example, if **9** is entered, the value is increased to **16**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Height
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	Height, Width
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

## SubRegionMode

[SubRegionSelector]

Enables or disables the selected subregion.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Height, OffsetX, OffsetY, Width
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
<i>On</i>	The selected subregion is enabled.
<i>Off</i>	The selected subregion is disabled (default).

## SubRegionOffsetX

[SubRegionSelector]

X-offset of the selected subregion.

**Note:** If values are entered that are not dividable by 8, **SubRegionOffsetX** is increased automatically to the next higher available value. For example, if **18** is entered, the value is increased to **32**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Offset X
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	OffsetX
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

## SubRegionOffsetY

[SubRegionSelector]

Y-offset of the selected subregion.

**Note:** If values are entered that are not dividable by 8, **SubRegionOffsetY** is increased automatically to the next higher available value. For example, if **9** is entered, the value is increased to **16**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Offset Y
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	OffsetY
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment

## SubRegionSelector

Selects the subregion in a range from  $\theta$  to  $n$ , where  $\theta$  is the index of the first subregion and  $n$  is the index of the last one.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	SubRegionHeight, SubRegionMode, SubRegionWidth, SubRegionOffsetX, SubRegionOffsetY
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

<b>Values<sup>1</sup></b>	<b>Description</b>
<i>Region<math>\theta</math></i>	Minimum
<i>Region<math>N</math></i>	Maximum

## SubRegionWidth

[SubRegionSelector]

Width of the selected subregion.

**Note:** If values are entered that are not dividable by 8, **SubRegionWidth** is increased automatically to the next higher available value. For example, if **626** is entered, the value is increased to **640**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sub Region Height
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	Height
<b>Category</b>	/ImageFormatControl/MultipleRegionControl

Values	Description
Model dependent	Minimum
(Height max)	Maximum, depending on the height of other subregions
Model dependent	Increment



## ImageFormatControl (category continued)

The feature descriptions for the `/ImageFormatControl/MultipleRegionControl` subcategory have ended on the previous page. The following features continue the `/ImageFormatControl` category, without a subcategory.

### ShutterMode

Selects the shutter type for cameras where the sensor can be operated in different shutter modes.

<b>Interface support</b>	All
<b>Display name</b>	Shutter Mode
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageFormatControl

Values*	Description
<i>GlobalResetReleaseShutter</i>	The camera is operated using global reset release shutter (GRS).
<i>GlobalShutter</i>	The camera is operated using global shutter (GS).
<i>RollingShutter</i>	The camera is operated using rolling shutter (RS).

\* Camera model dependent

## Width

Controls the image width of the image output by the camera.

<b>Interface support</b>	All
<b>Display name</b>	Width
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixel
<b>Affected features</b>	OffsetX, AutoModeRegionOffsetX, AutoModeRegionWidth, AcquisitionFrameRate, ExposureAutoMin, ExposureAutoMax, ExposureTime, PayloadSize
<b>Category</b>	/ImageFormatControl

## WidthMax

Displays the available maximum image width.

**Note:** The dimension is calculated after horizontal binning or any other function changing the horizontal dimension of the image.

<b>Interface support</b>	All
<b>Display name</b>	Width Max
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Pixel
<b>Affected features</b>	Width, OffsetX
<b>Category</b>	/ImageFormatControl

## ImageProcessingControl

The features in this category enable on-board image processing for contrast, noise suppression and convolution filters, sharpness and blur. You can use `ColorInterpolation` to select the number of merged pixels used for debayering.

<b>Interface support</b>	All
<b>Display name</b>	Image Processing Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## AdaptiveNoiseSupressionFactor

Controls the amount of the noise suppression.

<b>Interface support</b>	All
<b>Display name</b>	Adaptive Noise Supression Factor
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl

Values	Description
0.5	Minimum
1	The feature is disabled.
2	Maximum

## ColorInterpolation

Selects the `ColorInterpolation` filter.

**Note:** This feature is available only with color models.

<b>Interface support</b>	All
<b>Display name</b>	Color Interpolation
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl

Values	Description
<i>Basic2x2</i>	Basic 2×2 algorithm for debayering is selected.
<i>Bilinear3x3</i>	A standard 3×3 algorithm for debayering is selected.
<i>HighQuality Linear5x5</i>	A high-quality linear interpolation for debayering is selected (default).

## ContrastControl (subcategory)

The features in this subcategory enable on-board image processing for contrast.

<b>Interface support</b>	All
<b>Display name</b>	Contrast Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Subcategory
<b>Category</b>	/ImageProcessingControl

## ContrastBrightLimit

Selects the maximum gray value for the image.

**Note:** The current **value ranges displayed for 8-bit and 10-bit pixel formats are higher than the calculated values.**

<b>Interface support</b>	All
<b>Display name</b>	Contrast Bright Limit
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	ContrastDarkLimit
<b>Category</b>	/ImageProcessingControl/ContrastControl

Values	Description
$ContrastDarkLimit + 1$	The minimum value is selected.
4095	The maximum value is selected.

Pixel bit depth [bit]	Value range	Calculated value range	Pixel count per increment
8	0 to 4095	0 to 255	$\frac{1}{16}$
10	0 to 4095	0 to 1023	$\frac{1}{4}$
12		0 to 4095	1

## ContrastDarkLimit

Selects the minimum gray value for the image.

**Note:** The current **value ranges displayed for 8-bit and 10-bit pixel formats are higher than the calculated values.** See [ContrastBrightLimit](#) on page 229.

<b>Interface support</b>	All
<b>Display name</b>	Contrast Dark Limit
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	ContrastBrightLimit
<b>Category</b>	/ImageProcessingControl/ContrastControl

Values	Description
$\emptyset$	The minimum value is selected.
$ContrastBrightLimit - 1$	The maximum value is selected.

## ContrastEnable

Enables or disables the contrast enhancement features.

<b>Interface support</b>	All
<b>Display name</b>	Contrast Enable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl/ContrastControl

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

## ContrastShape

Controls the sigmoid shape of the transfer curve.

<b>Interface support</b>	All
<b>Display name</b>	Contrast Shape
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl/ContrastControl

Values	Description
1	Minimum
4	Default value
10	Maximum
1	Increment

Figure 14 and Figure 15 on page 232 show the transfer curves for different values.

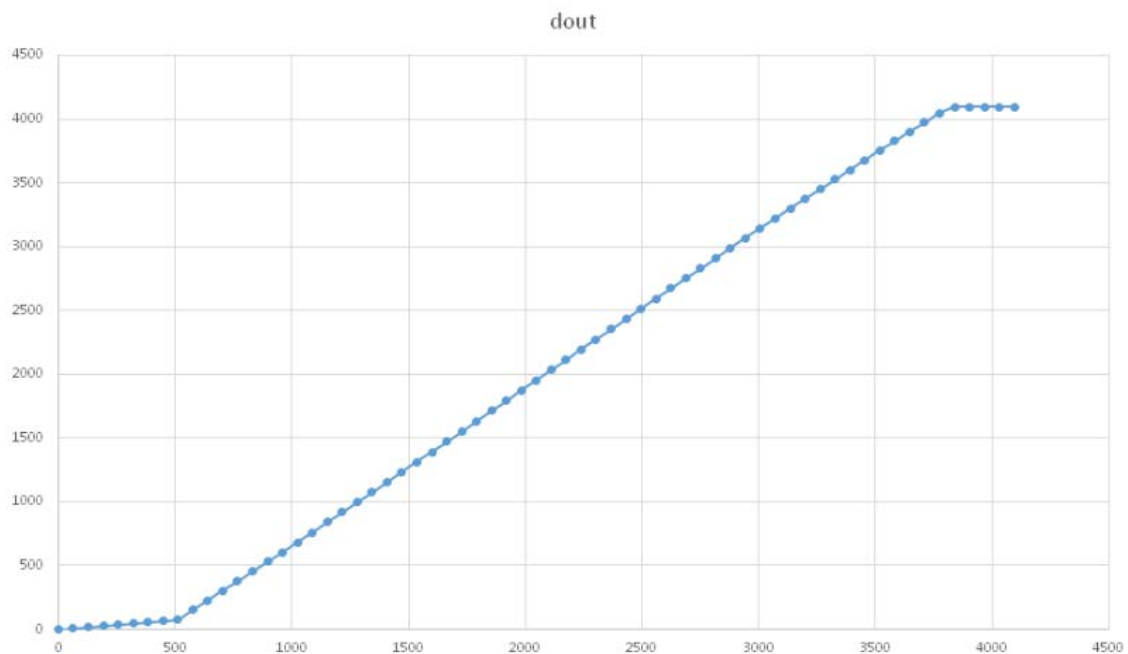


Figure 14: Image transfer for a value of 1.

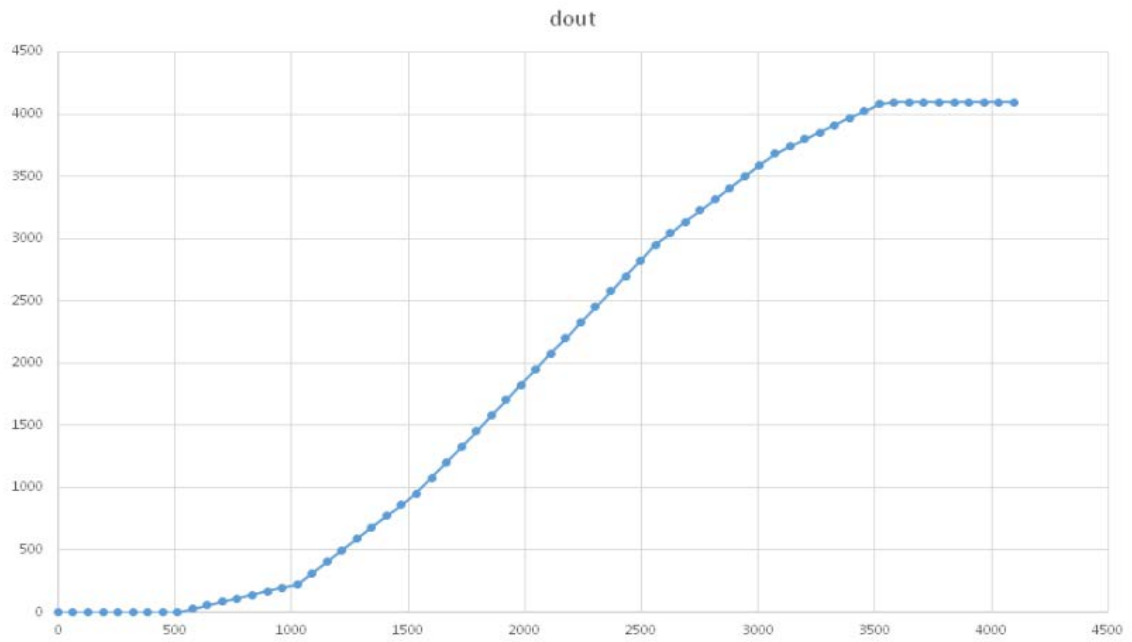


Figure 15: Image transfer for a value of 9.



## ImageProcessingControl (category continued)

The feature descriptions for the `/ImageProcessingControl/ContrastControl` subcategory have ended on the previous page. The following features continue the `/ImageProcessingControl` category, without a subcategory.

### ConvolutionMode

Selects the convolution filter to process the image.

Various filters enable to reduce image noise, emphasize the edges of an image, or to perform individual image processing.

<b>Interface support</b>	All
<b>Display name</b>	Convolution Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AdaptiveNoiseSuppression, CustomConvolutionValue, Sharpness
<b>Category</b>	/ImageProcessingControl

Values	Description
<i>AdaptiveNoiseSuppression</i>	To reduce noise while keeping the edges, the adaptive noise suppression is selected, (controlled by <b>AdaptiveNoiseSuppressionFactor</b> ).
<i>CustomConvolution</i>	Your individual settings defined in <b>CustomConvolutionValue</b> are selected.
<i>Off</i>	The feature is disabled (default).
<i>Sharpness</i>	To increase the contrast of edges, the sharpness mode is selected, (controlled by <b>Sharpness</b> ).

## CustomConvolutionValue

[CustomConvolutionValueSelector]

Sets the value for the convolution filter selected by CustomConvolutionValueSelector.

<b>Interface support</b>	All
<b>Display name</b>	Custom Convolution Value
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl
Values	Description
0	Minimum
255	Maximum

## CustomConvolutionValueSelector

Defines the position to read from or write to the selected *CustomConvolution* filter, using *CustomConvolutionValue*.

<b>Interface support</b>	All
<b>Display name</b>	Custom Convolution Value Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AdaptiveNoiseSuppressionFactor, CustomConvolutionValue, Sharpness
<b>Category</b>	/ImageProcessingControl

Values	Description
<i>Coefficient 00...04</i>	Selects coefficients from 00 to 04.
<i>Coefficient 10...14</i>	Selects coefficients from 10 to 14.
<i>Coefficient 20...24</i>	Selects coefficients from 20 to 24.
<i>Coefficient 30...34</i>	Selects coefficients from 30 to 34.

	0	1	2	3	4
0	00	01	02	03	04
1	10	11	12	13	14
2	20	21	22	23	24
3	30	31	32	33	34
4	40	41	42	43	44

Figure 16: Matrix for coefficient values

## Sharpness

Selects the degree of sharpness or blurring of the image.

<b>Interface support</b>	All
<b>Display name</b>	Sharpness
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/ImageProcessingControl

Values	Description
-12	Maximum blurring is applied.
0	The image is not affected (default).
12	Maximum sharpness is applied.

## LensShadingCorrection

Some lenses do not illuminate the image plane uniformly across the image plane. Brightness decreases towards the corners in circles. This effect is called lens shading. The features in this category can be used to compensate for this effect.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Compensation
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

### Functional overview

Figure 17 shows schematically how the lens shading correction works.

`LensShadingCenterOffsetX` and `LensShadingCenterOffsetY` define the center position of the lens shading effect.

`LensShadingValue` defines the factor to brighten up the image. This is done in concentric circles counted from the origin  $C_{\text{Lens Shading}}$ .

`LensShadingIndex` counts the circle where you want to apply the next step to brighten up the image, counted as offset from the origin  $C_{\text{Lens Shading}}$  in pixels.

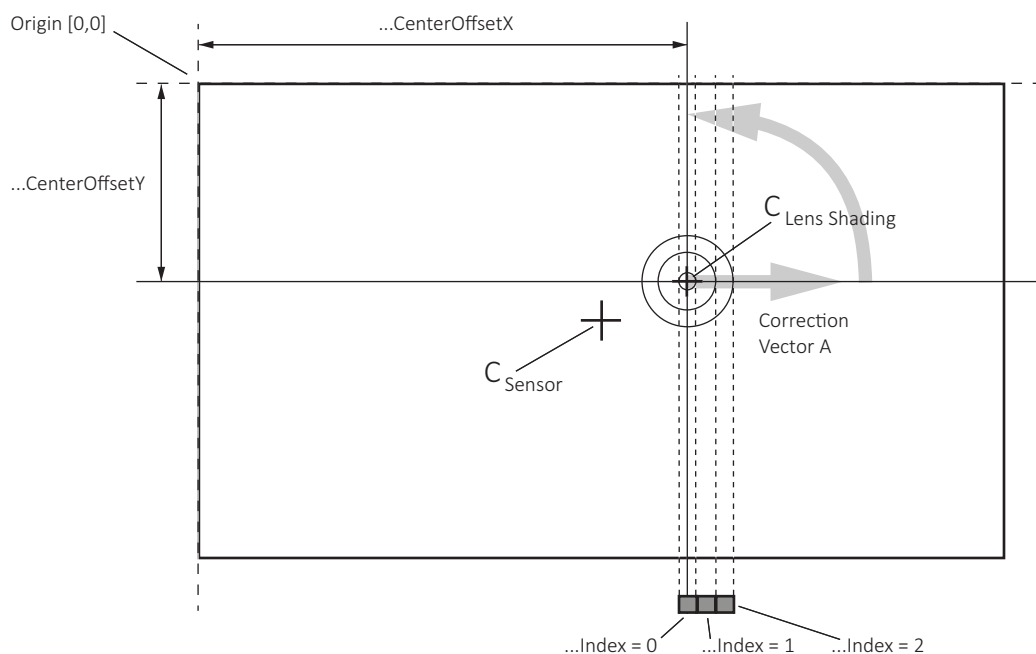


Figure 17: Lens shading correction overview

Lens shading features affect the brightness values for each pixel as shown in this equation:

$$out(x,y) = in(x,y) * A\left(\sqrt{(o_x - x)^2 + (o_y - y)^2}\right)$$

*Equation 1: Calculating input and output values for image brightness by pixel*

With the following variables:

Variable	Related feature or description
$o_x$	LensShadingCenterOffsetX
$o_y$	LensShadingCenterOffsetY
$A()$	LensShadingIndex, LensShadingValue
$x$	X coordinate of input pixel
$y$	Y coordinate of input pixel

*Table 10: Variable in the equation above*

## LensShadingCenterOffsetX

Controls the horizontal distance of  $C_{\text{Lens Shading}}$  to the origin. See [Figure 17](#) on page 237.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Center OffsetX
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

Values	Description
Camera model dependent	Minimum
Camera model dependent	Maximum

## LensShadingCenterOffsetY

Controls the vertical distance of  $C_{\text{Lens Shading}}$  to the origin. See [Figure 17](#) on page 237.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Center OffsetY
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Pixels
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

Values	Description
Camera model dependent	Minimum
Camera model dependent	Maximum

## LensShadingEnable

Enables or disables the lens shading correction.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Enable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

Values	Description
<i>False</i>	The lens shading correction is disabled (default).
<i>True</i>	The lens shading correction is enabled.

## LensShadingIndex

Selects the circle where the lens shading correction multiplies brightness values by `LensShadingValue`. This value is maintained until the next circle defined by `LensShadingIndex`.

**Note:** This feature counts from the origin  $C_{\text{Lens Shading}}$  in pixels as shown in [Figure 17](#) on page 237.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Index
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

Values	Description
$\emptyset$	Minimum
Camera model dependent	Maximum

## LensShadingLoadAll

Loads configuration datasets for the lens shading correction from the non-volatile memory of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Load All
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection



## LensShadingSaveAll

Saves configuration datasets for the lens shading correction to the non-volatile memory of the camera.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Save All
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

## LensShadingValue

Controls the factor to multiply the image brightness starting from the selected circle defined by `LensShadingIndex`. See [Figure 17](#) on page 237.

<b>Interface support</b>	All
<b>Display name</b>	Lens Shading Value
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Float
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/LensShadingCorrection

Values	Description
0	Minimum
1	The current brightness is maintained (default).
8	Maximum

## LUTControl

The features in this category can be used to change intensity values, adjusted by luminance and RGB color channels.

<b>Interface support</b>	All
<b>Display name</b>	LUT Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## LUTEnable

[LUTSelector]

Enables or disables the selected LUT.

<b>Interface support</b>	All
<b>Display name</b>	LUT Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	LUTIndex, LUTValue
<b>Category</b>	/LUTControl

Values	Description
<i>False</i>	The selected LUT is disabled.
<i>True</i>	The selected LUT is enabled.

## LUTIndex

[LUTSelector]

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

<b>Interface support</b>	All
<b>Display name</b>	LUT Index
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	LUTValue
<b>Category</b>	/LUTControl

Values	Description
0	Minimum
4095	Maximum

## LUTLoadAll

Loads the LUT configuration from the non-volatile memory of the camera to replace the current LUT configuration.

<b>Interface support</b>	All
<b>Display name</b>	LUT Load All
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	LUTIndex, LUTValue, LUTValueAll
<b>Category</b>	/LUTControl

## LUTSaveAll

Saves the current LUT configuration to the non-volatile memory of the camera.

<b>Interface support</b>	All
<b>Display name</b>	LUTSave All
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	LUTIndex, LUTValue, LUTValueAll
<b>Category</b>	/LUTControl

## LUTSelector

Selects the LUT to be controlled.

<b>Interface support</b>	All
<b>Display name</b>	LUT Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	LUTEnable, LUTIndex, LUTValue
<b>Category</b>	/LUTControl

Values	Description
<i>Blue</i>	The LUT for blue is selected.
<i>Green</i>	The LUT for green is selected.
<i>Luminance</i>	The LUT for luminance is selected.
<i>Red</i>	The LUT for red is selected.

## LUTValue

[LUTSelector][LUTIndex]

Controls the value for the selected LUT.

<b>Interface support</b>	All
<b>Display name</b>	LUT Value
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not affected
<b>Category</b>	/LUTControl

Values	Description
0	Minimum
4095	Maximum

## LUTValueAll

[LUTSelector]

Controls all the LUT coefficients in a single access without using individual LUTIndex. This can be used to write values for red, green, or blue at once.

### Notes

- Monochrome cameras support only *Luminance*, not RGB.
- One LUT entry is 12 bit, so 1 value occupies 2 Bytes (8192 elements) in the Raw data array.
- Values can be read and written at the same time.

<b>Interface support</b>	All
<b>Display name</b>	LUT Value All
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Raw
<b>Access</b>	R/W
<b>Affected features</b>	Not affected
<b>Category</b>	/LUTControl

## PtpControl

**Note:** Features in this category are **available for Alviium GigE cameras only**.

The features in this category can be used to synchronize your camera, for example, with other cameras.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## PtpClockAccuracy

Displays the expected accuracy of the camera's PTP clock when it is the grandmaster, or in the event it becomes the grandmaster.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Clock Accuracy
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

<b>Values</b>	<b>Description</b>
<i>Unknown</i>	The accuracy cannot be stated (default).

## PtpClockID

Displays the latched **parent** clock ID of the PTP device (=camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Clock ID
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
0	Minimum
9223372036854775807	Maximum

## PtpDataSetLatch

Latches the current values from the camera's PTP clock data set.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Data Set Latch
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

## PtpEnable

Enable or disables using the Precision Time Protocol (PTP).

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
<i>False</i>	PTP is disabled (default).
<i>True</i>	PTP is enabled.

## PtpGrandmasterClockID

Displays the latched **grandmaster** clock ID of the PTP device (=camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Grandmaster Clock ID
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
<i>0</i>	Minimum
<i>9223372036854775807</i>	Maximum



## PtpOffsetFromMaster

Displays the latched offset from the PTP master clock.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Offset From Master
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	ns (nanoseconds)
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
-2147483648	Minimum
2147483647	Maximum

## PtpOperationMode

Controls the IEEE 1588 operation mode.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Operation Mode
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
<i>Auto</i>	The status for the camera is set automatically.
<i>Master</i>	Sets the camera to be master.
<i>Slave</i>	Sets the camera to be slave.

## PtpParentClockID

Displays the latched **parent** (=current master) clock ID of the PTP device (=camera).

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Parent Clock ID
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
$\emptyset$	Minimum
9223372036854775807	Maximum

## PtpServoStatus

Displays the latched state of the PTP Servo Clock.



### PTP accuracy

The average accuracy for PTP is 12  $\mu$ s.

- **Typical PTP lock type** with Alvium cameras:  
Floating lock state in cycles: *Idle* > *Locked* > *Stepchange*  
Average offset from Master: < 12  $\mu$ s
- **Other PTP lock type** with Alvium cameras (temporary, cannot be forced):  
Strong lock state: *Locked*.  
Average offset from Master: < 1  $\mu$ s

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Servo Status
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description
<i>CLockChange</i>	The status of the clock frequency configuration is changed. This occurs when there is a big difference between master and slave clock frequency.
<i>Idle</i>	The status of the clock controller is in idle state (waiting for all data collection).
<i>Locked</i>	The status of the clock controller is in adjusting state, the PI controller is used to follow the master clock drift.
<i>StepChange</i>	The status of the clock counter is changed step-by-step.
<i>Unknown</i>	The status of the clock controller is set to Unknown (for example, if the camera works as a Master).

## PtpStatus

Displays the PTP status.

<b>Interface support</b>	GigE
<b>Display name</b>	Ptp Status
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/PtpControl

Values	Description <sup>1</sup>
1	Initializing
2	Faulty
3	Disabled
4	Listening
5	Pre Master
6	Master
7	Passive
8	Uncalibrated
9	Slave

<sup>1</sup>Refer to the IEEE 1588-2008 specification for additional information on PTP states.

## SequencerControl

**Note:** Features in this category are **available for Alvium 1800 U and GigE cameras with Sony IMX global shutter sensors only**. The support for Alvium CSI-2 is intended for a future firmware release. The features in this category can be used to trigger camera feature settings in sequencer sets ("**set**" **on this page**) during acquisition in a predefined order.



### Using Alvium Sequencer features

The Alvium Sequencer is very powerful. We recommend you to read the Getting Started with the Alvium Sequencer application note at [www.alliedvision.com/fileadmin/content/documents/products/cameras/Alvium\\_common/appnote/Getting-Started\\_Alvium\\_Sequencer.pdf](http://www.alliedvision.com/fileadmin/content/documents/products/cameras/Alvium_common/appnote/Getting-Started_Alvium_Sequencer.pdf) to ease setting up your application.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## SequencerConfigurationMode

Enables or disables configuration of the sequencer.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Configuration Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	ExposureAutoMin, ExposureAutoMax
<b>Category</b>	/SequencerControl

Values	Description
<i>Off</i>	Configuration of the sequencer is disabled (default).
<i>On</i>	Configuration of the sequencer is enabled.

## SequencerConfigurationReset

Deletes all sequencer sets from the non-volatile memory of the camera.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Configuration Reset
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Category</b>	/SequencerControl

## SequencerFeatureEnable

[SequencerFeatureSelector]

Displays which feature can be used in sequencer sets.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Feature Enable
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SequencerControl

Values	Description
<i>False</i>	The selected feature is disabled (default).
<i>True</i>	The selected feature is enabled.

## SequencerFeatureSelector

Selects the features to be inquired by `SequencerFeatureEnable`.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Feature Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/SequencerControl

### Values

AcquisitionFrameRate, AcquisitionFrameRateEnable, BalanceRatioBlue, BalanceRatioRed, ColorTransformationEnable, ColorTransformationValue, ExposureTime, Gain, Gamma, Hue, OffsetX, OffsetY, Saturation

## SequencerMode

Enables or disables the sequencer.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	PayloadSize
<b>Category</b>	/SequencerControl

### Values

### Description

<i>Off</i>	The sequencer is disabled (default).
<i>On</i>	The sequencer is enabled.

## SequencerSetActive

Displays the index of the currently active sequencer set.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Active
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/SequencerControl

Values	Description
0	Minimum
4294967295	Maximum

## SequencerSetLoad

[SequencerSetSelector]

Loads and activates the sequencer set selected by **SequencerSetSelector** from the non-volatile memory of the camera.

**Note:** Even if **SequencerMode** is *Off*, the configuration of the selected sequencer is activated on the camera.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Load
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	AcquisitionFrameRate, AcquisitionFrameRateEnable, BalanceRatioBlue, BalanceRatioRed, ColorTransformationEnable, ColorTransformationValue, ExposureTime, Gain, Gamma, Hue, OffsetX, OffsetY, Saturation
<b>Category</b>	/SequencerControl



## SequencerSetSave

[SequencerSetSelector]

Saves the sequencer set selected by **SequencerSetSelector** to the non-volatile memory of the camera.

**Note:** Even if **SequencerMode** is *Off*, the selected set is saved.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Save
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	See <b>SequencerSetLoad</b> .
<b>Category</b>	/SequencerControl

## SequencerSetSelector

Selects the sequencer set to be configured or used.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	See <b>SequencerSetLoad</b> .
<b>Category</b>	/SequencerControl

Values	Description
<i>Set0</i>	Set0 is selected (default).
<i>Set1</i>	Set1 is selected.
...	...
<i>Set15</i>	Set15 is selected.

## SequencerSetStart

Selects the sequencer set to start with.

**Note:** The sequencer set selected by `SequencerSetStart` is the initial sequencer set, including sets grouped in paths. See [SequencerPathControl \(subcategory\)](#) on page 259.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Start
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/SequencerControl

Values	Description
0	Minimum
15	Maximum

## SequencerPathControl (subcategory)

**Note:** Features in this subcategory are **available for the following Alvium cameras with Sony IMX global shutter sensors only:**

- Alvium 1800 U
- Alvium GigE cameras

The support for Alvium CSI-2 is intended for a future firmware release.

The features in this subcategory can be used to configure the Sequencer Paths of sequencer sets to be triggered.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Path Control
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/SequencerControl

## SequencerPathSelector

[SequencerSetSelector]

Selects the SequencerPath including the sequencer sets to be configured or used.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Path Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	SequencerSetNext, SequencerTriggerSource, SequencerTriggerActivation
<b>Category</b>	/SequencerControl/SequencerPathControl

Values	Description
<i>Path0</i>	Path0 is selected to be configured (default).
<i>Path1</i>	Path1 is selected to be configured.
...	...
<i>Path7</i>	Path7 is selected to be configured.

## SequencerSetNext

[SequencerSetSelector][SequencerPathSelector]

Selects the next sequencer set to be configured or used.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Set Next
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	SequencerSetNext, SequencerTriggerSource, SequencerTriggerActivation
<b>Category</b>	/SequencerControl/SequencerPathControl

Values	Description
0	Minimum
15	Maximum

## SequencerTriggerActivation

[SequencerSetSelector][SequencerPathSelector]

Selects the electrical signal level to trigger the corresponding sequencer set.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Trigger Activation
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/SequencerControl/SequencerPathControl

Values	Description
<i>AnyEdge</i>	The sequencer is triggered on the falling or rising edge of the signal.
<i>FaLLingEdge</i>	The sequencer is triggered on the falling edge of the signal.
<i>LevelHigh</i>	The sequencer is triggered at a high signal level.
<i>LevelLow</i>	The sequencer is triggered at a low signal level.
<i>RisingEdge</i>	The sequencer is triggered on the rising edge of the signal.

## SequencerTriggerSource

[SequencerSetSelector][SequencerPathSelector]

Selects the internal signal or physical input line to use as source for triggering the sequencer.

**Note:** The selected trigger must have its **TriggerMode** set to **On**.

<b>Interface support</b>	GigE, USB
<b>Display name</b>	Sequencer Trigger Source
<b>Standard</b>	SFNC (adapted)
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/AcquisitionControl

Values	Description
<i>Action0</i> <sup>1</sup>	The Action0 command is output as source signal.
<i>Action1</i> <sup>1</sup>	The Action1 command is output as source signal.
<i>Counter0Active</i>	The Counter0Active signal triggers the sequencer.
<i>Counter1Active</i>	The Counter1Active signal triggers the sequencer.
<i>Counter2Active</i>	The Counter2Active signal triggers the sequencer.
<i>Counter3Active</i>	The Counter3Active signal triggers the sequencer.
<i>ExposureActive</i> <sup>2</sup>	The ExposureActive signal triggers the sequencer.
<i>FrameActive</i>	The FrameActive signal triggers the sequencer.
<i>Line0</i>	Physical Line0 triggers the sequencer.
<i>Line1</i>	Physical Line1 triggers the sequencer.
<i>Line2</i> <sup>3</sup>	Physical Line2 triggers the sequencer.
<i>Line3</i> <sup>3</sup>	Physical Line3 triggers the sequencer.
<i>Off</i>	Triggering is disabled.
<i>SoftwareSignal0</i>	SoftwareSignal0 triggers the sequencer.
<i>SoftwareSignal1</i>	SoftwareSignal1 triggers the sequencer.
<i>...N</i>	SoftwareSignalN triggers the sequencer.
<i>Timer0Active</i>	The Timer0Active signal triggers the sequencer.
<i>Timer1Active</i>	The Timer1Active signal triggers the sequencer.

<sup>1</sup> Currently, available with Alvium GigE cameras only.

<sup>2</sup> Available for cameras with global shutter sensors and with rolling shutter sensors if TriggerMode is enabled or if AcquisitionMode is set to Continuous.

<sup>3</sup> Available with Alvium GigE and Alvium USB cameras. Alvium CSI-2 cameras support Line0 and Line1 only.

Table 11: SequencerTriggerSource values

## SoftwareSignalControl

The features in this category can be used by external devices to trigger actions within the camera by software commands.

See [ActionControl](#) on page 107 for the interaction with features in this category.

<b>Interface support</b>	All
<b>Display name</b>	Software Signal Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## SoftwareSignalPulse

[SoftwareSignalSelector]

Generates a pulse signal used by external devices to trigger actions within the camera by software commands.

<b>Interface support</b>	All
<b>Display name</b>	Software Signal Pulse
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/SoftwareSignalControl

## SoftwareSignalSelector

Selects which Software Signal features to control.

<b>Interface support</b>	All
<b>Display name</b>	Software Signal Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	SoftwareSignalPulse
<b>Category</b>	/SoftwareSignalControl
<b>Values</b>	<b>Description</b>
<i>SoftwareSignal0</i>	Selects software signal 0 (default).
<i>SoftwareSignal1</i>	Selects software signal 1.

## TestControl

The feature in this category can be used to test if packets are transmitted successfully between the host and the camera.

<b>Interface support</b>	All
<b>Display name</b>	Test Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## TestEventGenerate

Generates events for `EventTest` and `EventTestTimestamp`. See [EventControl](#) on page 188.

<b>Interface support</b>	GigE
<b>Display name</b>	Test Event Generate
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TestControl



## TestPendingAck

Tests the camera's pending acknowledge feature. When this feature is written, the camera waits a time period corresponding to the value of **TestPendingAck** before acknowledging the write.

**Note:** If you select a high value, the camera does not respond for a long time.

<b>Interface support</b>	All
<b>Display name</b>	Test Pending Ack
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	ms
<b>Affected features</b>	Not applicable
<b>Category</b>	/TestControl

Values	Description
0	Minimum
60000	Maximum

## TransferControl

**Note:** Features in this category are **available for Alvium GigE cameras only**. Support for the other Alvium series is intended for a future firmware release.

The features in this category can be used to acquire a sequence of images as a burst.

<b>Interface support</b>	GigE
<b>Display name</b>	Transfer Control
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## TransferControlMode

[TransferSelector]

Enables or disables image acquisition as burst.

<b>Interface support</b>	GigE
<b>Display name</b>	Transfer Control Mode
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate
<b>Category</b>	/TransferControl

Values	Description
<i>Automatic</i>	The image burst is enabled
<i>Basic</i>	The image burst is disabled (default).

## TransferQueueCurrentBlockCount

[TransferSelector]

Displays the current number of images in the frame buffer.

<b>Interface support</b>	GigE
<b>Display name</b>	Transfer Queue Current Block Count
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransferControl

Values	Description
0	Minimum
4294967295	Maximum

## TransferQueueMaxBlockCount

[TransferSelector]

Controls the maximum number of images that can be stored in the frame buffer.

<b>Interface support</b>	GigE
<b>Display name</b>	Transfer Queue Max Block Count
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransferControl

Values	Description
0	Minimum
4294967295	Maximum

## TransferSelector

Selects the stream to be configured by Transfer Control features. Use as a reference for your host software.

<b>Interface support</b>	GigE
<b>Display name</b>	Transfer Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	AcquisitionFrameRate, TransferControlMode, TransferQueueCurrentBlockCount, TransferQueueMaxBlockCount
<b>Category</b>	/TransferControl
<b>Values</b>	<b>Description</b>
<i>Stream0</i>	Stream 0 is selected.

## TransportLayerControl

The features in this category can be used to display the current bandwidth use and the transfer status of packets between the host and the camera on the transport layer level.

<b>Interface support</b>	All
<b>Display name</b>	Transport Layer Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## GigEVision

**Note:** Features in this subcategory are **available for Alvim GigE cameras only**.

The features in this subcategory can be used to control IP settings, the communication between the host and the camera, and the transfer of data packets.

<b>Interface support</b>	GigE
<b>Display name</b>	GigE
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)
<b>Category</b>	/TransportLayerControl

## GevCurrentDefaultGateway

Displays the current default gateway address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current Default Gateway
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

## GevCurrentIPAddress

Displays the current IP address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current IP Address
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEvision

## Priorities for assigning IP addresses

Figure 18 shows the workflow to assign IP addresses to cameras according to the GigE Vision standard:

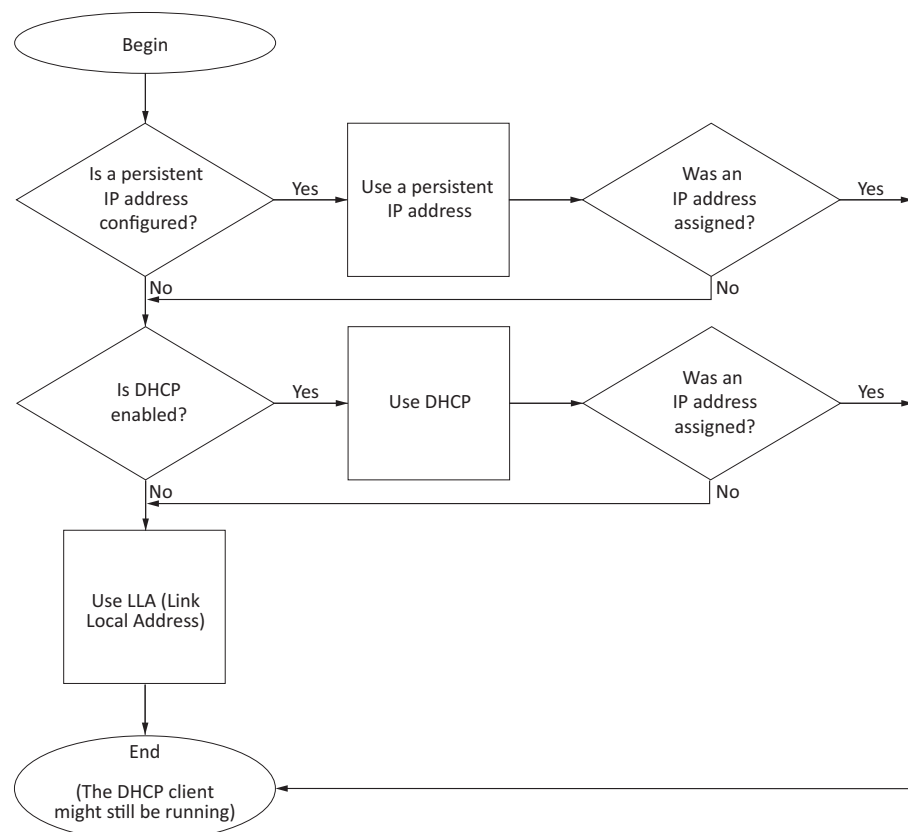


Figure 18: Priorities for assigning IP addresses

## GevCurrentIPConfigurationDHCP

Enables or disables IP settings being configured by DHCP.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current IP Configuration DHCP
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEvision

Values	Description
<i>True</i>	IP settings are configured by DHCP (dynamic host configuration protocol) (default).
<i>False</i>	IP settings are configured by LLA or by the user (persistent IP).



### Priorities for assigning IP addresses

See the flowchart in [Figure 18: Priorities for assigning IP addresses](#) on page 270 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

## GevCurrentIPConfigurationLLA

Enables or disables IP settings being configured by LLA.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current IP Configuration LLA
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

Values	Description
<i>True</i>	IP settings are configured by LLA (link-local address) (default).



### Priorities for assigning IP addresses

See the flowchart in [Figure 18: Priorities for assigning IP addresses](#) on page 270 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.



## GevCurrentIPConfigurationPersistentIP

Enables or disables IP settings being configured by manually by the user.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current IP Configuration Persistent IP
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	GevCurrentIPConfigurationDHCP, GevIPConfigurationStatus
<b>Category</b>	/TransportLayerControl/GigEvision

Values	Description
<i>True</i>	IP settings are configured manually by the user.
<i>False</i>	IP settings are configured by LLA or DHCP (default).



### Priorities for assigning IP addresses

See the flowchart in [Figure 18: Priorities for assigning IP addresses](#) on page 270 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

## GevCurrentSubnetMask

Displays the current subnet mask address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Current Subnet Mask
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

## GevIPConfigurationStatus

Displays if IP settings are configured by DHCP, LLA, or manually by the user.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev IP Configuration Status
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

Values	Description
<i>DHCP</i>	IP settings are configured by DHCP (dynamic host configuration protocol) (default). If no DHCP server is found, DHCP falls back to LLA automatically i.
<i>LLA</i>	IP settings are configured by LLA (link-local address).
<i>Persistent</i>	IP settings are configured manually by the user.



### Priorities for assigning IP addresses

See the flowchart in [Figure 18: Priorities for assigning IP addresses](#) on page 270 for the priorities between `GevCurrentIPConfigurationPersistentIP`, `GevCurrentIPConfigurationDHCP`, and `GevCurrentIPConfigurationLLA`.

## GevMACAddress

Displays the current MAC address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev MAC Address
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

## GevPersistentDefaultGateway

Selects the default gateway address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Persistent Default Gateway
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

## GevPersistentIPAddress

Selects the IP address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Persistent IP Address
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEVision

## GevPersistentSubnetMask

Selects the subnet mask address.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev Persistent Subnet Mask
<b>Standard</b>	SFNC adapted
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/GigEvision

## GevSCSPacketSize

Controls the stream packet size to be transmitted on the selected channel for a GVSP transmitter.

Displays the maximum packet size supported by a GVSP receiver.

### Notes:

- The following data is excluded: Data leader, data trailer, the last data packet (which might be of smaller size because the packet size is not necessarily a multiple of block size for stream channel).
- If cameras cannot support the requested packet size, they must not fire test packets when requested to do so.
- `DeviceStreamChannelPacketSize` is updated after writing to `GevSCSPacketSize`.

<b>Interface support</b>	GigE
<b>Display name</b>	Gev SCPS Packet Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	<code>DeviceStreamChannelPacketSize</code>
<b>Category</b>	/TransportLayerControl/GigEvision

## TransportLayerControlControl (category continued)

The feature descriptions for the `/TransportLayerControl/GigEVision` category have ended on the previous page. The following features continue the `/TransportLayerControl` category, without a subcategory.

### PayloadSize

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

<b>Interface support</b>	All
<b>Display name</b>	Payload Size
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl

Values	Description
0	Minimum

## Info (subcategory)

**Note:** Features in this subcategory are **available for Alvium CSI-2 cameras only**.

The features in this subcategory can be used to display the transfer status of packets between the host and the camera on the transport layer level.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Info
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Subcategory
<b>Category</b>	/TransportLayerControl

## CSI2ClockFrequency

Displays the MIPI CSI-2 clock frequency.

<b>Interface support</b>	CSI-2
<b>Display name</b>	CSI-2 Clock Frequency
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Hz [Hertz]
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

## CSI2DriverInterfaceVersion

Displays the version of the MIPI CSI-2 interface.

<b>Interface support</b>	CSI-2
<b>Display name</b>	CSI-2 Driver Interface Version
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

## CSI2LaneCount

Displays the number of used MIPI CSI-2 lanes.

<b>Interface support</b>	CSI-2
<b>Display name</b>	CSI-2 Lane Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer, camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

## LibcsiVersion

Displays the libcsi version.

<b>Interface support</b>	CSI-2
<b>Display name</b>	libcsi Version
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

## CSI2DriverVersion

Displays the version of the MIPI CSI-2 driver.

<b>Interface support</b>	CSI-2
<b>Display name</b>	CSI-2 Driver Version
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

## PacketCount

Displays the number of MIPI CSI-2 packets per frame.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Packet Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

Values	Description
0	Minimum
4294967295	Maximum

## PacketSize

Displays the size of MIPI CSI-2 packets.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Packet Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/TransportLayerControl/Info

Values	Description
0	Minimum
4294967295	Maximum



## UserSetControl

The features in this category enable to store and select user-specific camera settings, or to revert the camera to defined settings.

User sets can be loaded by default, without needing to set values by software after every restart of the camera. Or they can be used to switch between different settings, for example, to adjust from daylight to artificial light.

### Supported features

User sets on Alvium cameras support all features except for:

- Selectors
- Command features
- Read-only features
- Features that do not apply to the corresponding interface, such as CSI-2 related features on a USB camera
- Features in the LUTControl1 category.

<b>Interface support</b>	All
<b>Display name</b>	User Set Control
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	(Category)

## UserSetDefault

Selects the user set to be loaded by default when the camera is reset.

<b>Interface support</b>	All
<b>Display name</b>	User Set Default
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/UserSetControl

<b>Value</b>	<b>Description</b>
<i>Default</i>	The default user set is loaded at camera reset.
<i>UserSet1</i>	Your individual UserSet1 is loaded at camera reset.
<i>UserSet2</i>	Your individual UserSet2 is loaded at camera reset.
<i>UserSet3</i>	Your individual UserSet3 is loaded at camera reset.
<i>UserSet4</i>	Your individual UserSet4 is loaded at camera reset.

## UserSetLoad

[UserSetSelector]

Loads the user set specified by **UserSetSelector** to the camera.

<b>Interface support</b>	All
<b>Display name</b>	User Set Load
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
<b>Category</b>	/UserSetControl

## UserSetSave

[UserSetSelector]

Writes and saves the current setup and state of the camera to the user set specified by **UserSetSelector**.

<b>Interface support</b>	All
<b>Display name</b>	User Set Save
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
<b>Category</b>	/UserSetControl

## UserSetSelector

Selects the user set to be loaded or saved.

<b>Interface support</b>	All
<b>Display name</b>	User Set Selector
<b>Standard</b>	SFNC
<b>Origin of feature</b>	Camera
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	UserSetLoad, UserSetSave All features that are not excluded from user sets. See your Alvium camera's user guide for exceptions.
<b>Category</b>	/UserSetControl

<b>Value</b>	<b>Description</b>
<i>Default</i>	The default user set is selected.
<i>UserSet1</i>	Your individual UserSet1 set is selected.
<i>UserSet2</i>	Your individual UserSet2 set is selected.
<i>UserSet3</i>	Your individual UserSet3 set is selected.
<i>UserSet4</i>	Your individual UserSet4 set is selected.

# Feature descriptions: Stream 0



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**You need experience to use these features**

We recommend you to use features in this category only if you are an advanced user.

## BufferHandlingControl


**Stream 0 as GenTL Module**

Current Alvium cameras use Stream0 only.

The features in this category can be used to control the buffers in the acquisition engine of the data stream.

<b>Interface support</b>	All (most features)
<b>Display name</b>	Buffer Handling Control
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

### MaxDriverBuffersCount

Controls the maximum number of driver buffers used by the acquisition engine.

**Note:** We recommend you to use this feature only if you are an advanced user.

<b>Interface support</b>	CSI-2, USB
<b>Display name</b>	Max Driver Buffers Count
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/BufferHandlingControl

Values	Description
1	Minimum
4096	Maximum
1	Increment

## StreamAnnounceBufferMinimum

Displays the minimum number of buffers to announce to enable selected buffer handling mode. Corresponds to the `STREAM_INFO_BUF_ANNOUNCE_MIN` command of `DSGetInfo` function.

**Note:** We recommend you to use this feature only if you are an advanced user.

<b>Interface support</b>	All
<b>Display name</b>	Stream Announce Buffer Minimum
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/BufferHandlingControl

## StreamAnnouncedBufferCount

Displays the number of announced (known) buffers on this stream. Corresponds to the `STREAM_INFO_NUM_ANNOUNCED` command of `DSGetInfo` function.

**Note:** We recommend you to use this feature only if you are an advanced user.

<b>Interface support</b>	All
<b>Display name</b>	Stream Announced Buffer Count
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/BufferHandlingControl

Values	Description
0	Minimum
9223372036854775807	Maximum

## StreamBufferHandlingMode

Selects the available acquisition modes of the stream.

**Note:** We recommend you to use this feature only if you are an advanced user.

<b>Interface support</b>	All
<b>Display name</b>	Stream Buffer Handling Mode
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	StreamAcquisitionModeSelector
<b>Category</b>	/BufferHandlingControl
<b>Value</b>	<b>Description</b>
<i>Default</i>	Default stream buffer handling is available.

## Stream

**Note:** Features in this category are **available for Alvium GigE cameras only**.

The features in this category can be used to control data traffic between the host and the camera. This includes functions to avoid dropped frames. **MultiCast** can be used to synchronize the timing between cameras.

<b>Interface support</b>	GigE
<b>Display name</b>	Stream
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

### Info (subcategory)

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

The features in this subcategory can be used to display the MAC address of the camera and the version of the filter version for the GigE Vision Streaming Protocol.

<b>Interface support</b>	GigE
<b>Display name</b>	Info
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/Stream



## GVSPFilterCompatibility

Displays the compatibility of the transport layer and the found GVSP filter driver.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Filter Compatibility
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Info

Values	Description
<i>Matching</i>	The transport layer and the GVSP filter driver are compatible.
<i>TLOutdated</i>	The filter driver is newer than expected by the transport layer, but it is compatible.
<i>DriverOutdated</i>	The filter driver is older than expected by the transport layer, but it is compatible.
<i>Incompatible</i>	The transport layer and the filter driver are not compatible. The filter driver cannot be used for streaming.
<i>Disabled</i>	The filter driver is installed on the system but it is not enabled for the network adapter.

## GVSPFilterVersion

Displays the GVSP filter version.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Filter Version
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Info

## Multicast (subcategory)

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

The features in this subcategory enable synchronizing the timing between cameras.

<b>Interface support</b>	GigE
<b>Display name</b>	Multicast
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/Stream

## MulticastEnable

Enables or disables multicast.

<b>Interface support</b>	GigE
<b>Display name</b>	Multicast Enable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Boolean
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Multicast

Values	Description
<i>False</i>	Disables multicast.
<i>True</i>	Enables multicast.

## MulticastIPAddress

Selects the IP address of the target multicasting group. The Multicast transport layer protocol enables multiple cameras to use IP connections most effectively by sending packets to many receivers at the same time.

<b>Interface support</b>	GigE
<b>Display name</b>	Multicast IP Address
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Multicast

Values	Description
224.0.0.0	Minimum (0xE0.00.00.00 in hexadecimal or 3.758.096.384 in decimal)
239.255.255.255	Maximum (0xEF.FF.FF.FF in hexadecimal or 4.026.531.839 in decimal)

## Settings (subcategory)

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

The features in this subcategory can be used to control settings for the packet transfer between the host and the camera. **GVSPDriverSelector** enables to select between using the transport layer or the filter driver.

<b>Interface support</b>	GigE
<b>Display name</b>	Settings
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/Stream

## GVSPAdjustPacketSize

Request the packet size used to be adjusted automatically.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Adjust Packet Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Command
<b>Access</b>	W
<b>Affected features</b>	GVSPPacketSize, GevSCSPacketSize, DeviceStreamChannelPacketSize
<b>Category</b>	/Stream/Settings

## GVSPBurstSize

Controls the maximum number of GVSP packets to be processed in a burst.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Burst Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
1	Minimum
256	Maximum

## GVSPDriverSelector

Selects the streaming driver to be used.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Driver Selector
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
<i>Filter</i>	Selects the filter drivers stream engine (default).
<i>Socket</i>	Selects the transport layers stream engine.

## GVSPHostReceiveBufferSize

Controls the socket buffer space used to receive GVSP packets.

The operating system adjusts the socket buffer continuously. The value may be limited internally by the operating system. See the SO\_RCVBUF documentation of the operating system.

**Note:** This feature cannot be used with the filter driver.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Host Receive Buffer Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

## GVSPMaxLookBack

Controls the size for the detection of the missing GVSP packets under Windows.

This feature can be used to delay the first RESEND\_CMD for a missing GVSP packet by X packets.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Max Look Back
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
1	Minimum
1024	Maximum

## GVSPMaxRequests

Controls the maximum amount of RESEND\_CMDs requested for a missing GVSP packet.

**Note:** Setting the feature to 0 disables the GigE Vision resend mechanism. The transport layer or filter driver does not request the re-transmission of any missing GVSP packet.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Max Requests
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
0	Minimum, disables GigE Vision resend mechanism.
512	Maximum

## GVSPMaxWaitSize

Controls the maximum number of received GVSP packets following a resend request to wait before requesting again. The transport layer or the filter driver waits until GVSPMaxWaitSize of packets has been reached before requesting a resend for the same packet again.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Max Wait Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
8	Minimum
1024	Maximum

## GVSPMissingSize

Controls the maximum number of simultaneously missing GVSP packets before dropping the frame.

You can use this feature to cancel the reception of a single frame if the resend limit `GVSPMaxRequests` is reached for too many packets. The frame is marked as incomplete and returned to the GenTL consumer.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Missing Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
0	Minimum, disables the feature.
1024	Maximum

## GVSPPacketSize

Controls the total size of a GVSP packet, including the IP, UDP, and GVSP headers.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Packet Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Bytes
<b>Affected features</b>	GevSCPSPacketSize, DeviceStreamChannelPacketSize
<b>Category</b>	/Stream/Settings

Values	Description
500	Minimum for Alvium G1
9190	Maximum for Alvium G1
500	Minimum for Alvium G5/G5X
16358	Maximum for Alvium G5/G5X



## GVSP Tilting Size

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

You can use this feature to cancel the reception of a single frame if a certain number of GVSP packets of the following frame have already been received. The frame is marked as incomplete and returned to the GenTL consumer.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Tilting Size
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
0	Minimum, disables the feature.
1024	Maximum

## GVSP Timeout

Controls the timeout used for stream packets.

You can use this feature to react on a possible streaming interruptions. If no GVSP packet is received during the last **GVSP Timeout** milliseconds, the stream engine forces a resend of currently missing GVSP packets.

<b>Interface support</b>	GigE
<b>Display name</b>	GVSP Timeout
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport Layer
<b>Feature type</b>	Integer
<b>Access</b>	R/W
<b>Unit</b>	Milliseconds [ms]
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Settings

Values	Description
0	Minimum, disables the feature.
5000	Maximum

## Statistics (subcategory)

**Note:** Features in this subcategory are **available for Alvium GigE cameras only**.

The features in this subcategory can be used to display frame rates, streaming duration, and the transfer status of packets between the host and the camera.

<b>Interface support</b>	GigE
<b>Display name</b>	Statistics
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Subcategory)
<b>Category</b>	/Stream

## StatFrameDelivered

Displays the number of frames that have been delivered to the TL consumer without errors.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Delivered
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
4294967295	Maximum

## StatFrameDropped

Displays the number of frames received by the host that are incomplete due to missing packets.

**Note:** This does not include shoved frames.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Dropped
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
4294967295	Maximum

## StatFrameRate

Displays the frequency at which the device is sending frames to the host (derived from the frame timestamps).

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Hertz [Hz] (frames per second)
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
1.79769313486e+308	Maximum

## StatFrameRescued

Displays the number of frames that initially had missing packets but were successfully completed after packet resend.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Rescued
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
<b>Values</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## StatFrameShoved

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

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Shoved
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
<b>Values</b>	<b>Description</b>
0	Minimum
4294967295	Maximum

## StatFrameUnderrun

Displays the number of frames missed due to the non-availability of a user supplied buffer (buffer underrun).

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Frame Underrun
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
4294967295	Maximum

## StatLocalRate

Displays the frequency at which the host has received complete and incomplete frames (derived from the host clock).

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Local Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Hz (frames per second)
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
1.79769313486e+308	Maximum

## StatPacketErrors

Displays the number of received packets that are erroneous.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Errors
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
4294967295	Maximum

## StatPacketMissed

Displays the number of packets expected, but not received by the host.

**Note:** This does not include successfully resent packets.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Missed
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
4294967295	Maximum

## StatPacketReceived

Displays the number of error-free packets received and processed by the host.

**Note:** This includes successfully resent packets.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Received
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
Values	Description
0	Minimum
4294967295	Maximum

## StatPacketRequested

Displays the number of missing packets that were requested for resend from the camera.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Requested
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
Values	Description
0	Minimum
4294967295	Maximum

## StatPacketResent

Displays the number of missing packets that were resent by the camera after having been requested.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Resent
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
Values	Description
0	Minimum
4294967295	Maximum

## StatPacketUnavailable

Displays the number of packets that could not be resent by the camera after having been requested.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Packet Unavailable
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics
Values	Description
0	Minimum
4294967295	Maximum



## StatTimeElapsed

Displays the Elapsed time since the streaming was started.

<b>Interface support</b>	GigE
<b>Display name</b>	Stat Time Elapsed
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	Seconds [s]
<b>Affected features</b>	Not applicable
<b>Category</b>	/Stream/Statistics

Values	Description
0	Minimum
1.79769313486e+308	Maximum

## StreamInformation

The features in this category can be used to display, such as the streaming status, the frame rate, and the transfer status of frames sent by the camera.

<b>Interface support</b>	All (most features)
<b>Display name</b>	Stream Information
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	(Category)

## StreamID

Displays the camera's unique identifier for the stream, for instance a GUID.

<b>Interface support</b>	All
<b>Display name</b>	Stream ID
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	String
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation

## StreamIsGrabbing

Displays the status of the acquisition engine.

<b>Interface support</b>	CSI-2, USB
<b>Display name</b>	Stream Is Grabbing
<b>Standard</b>	GenTL SFNC
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Boolean
<b>Access</b>	R
<b>Affected features</b>	MaxDriverBuffersCount, StreamPayloadSizeMode, StreamPayloadSizeAlignment, ManualStreamPayloadSize
<b>Category</b>	/StreamInformation

Values	Description
<i>False</i>	Acquisition engine is not started.
<i>True</i>	Acquisition engine is started.

## StreamType

Displays the transport layer type of the data stream.

<b>Interface support</b>	All
<b>Display name</b>	Stream Type
<b>Standard</b>	GenTL SFNC adapted
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Enumeration
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation

<b>Values</b>	<b>Description</b>
<i>Custom</i>	The transport layer is MIPI CSI-2 type.
<i>GEV</i>	The transport layer is GigE type.
<i>USB3</i>	The transport layer is USB 3.x type.

## Statistics (subcategory)

**Note:** Features in this subcategory are **available for Alvium CSI-2 cameras only.**

The features in this subcategory can be used to display the frame rate and the transfer status of frames sent by the camera.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Statistics
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Subcategory
<b>Category</b>	/StreamInformation

## StatFrameRate

Displays the rate at which the device is sending frames to the host, derived from the frame timestamps.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Stat Frame Rate
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Float
<b>Access</b>	R
<b>Unit</b>	fps [frames per second]
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation/Statistics

Values	Description
0	Minimum
1.79769313486e+308	Maximum

## StatFrameCRCError

Displays the number of frames received with CRC errors.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Stat Frame CRC Error
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation/Statistics

Values	Description
0	Minimum
9223372036854775807	Maximum

## StatFrameDelivered

Displays the number of frames received without errors.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Stat Frame Delivered
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation/Statistics

Values	Description
0	Minimum
9223372036854775807	Maximum

## StatFrameIncomplete

Displays the number of incomplete frames received.

**Note:** Shoved frames are not included.

<b>Interface support</b>	CSI-2
<b>Display name</b>	Stat Frame Incomplete
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation/Statistics

Values	Description
0	Minimum
9223372036854775807	Maximum

## StatFrameUnderrun

Displays the number of missed frames caused by a missing user supplied buffer (buffer underrun).

<b>Interface support</b>	CSI-2
<b>Display name</b>	Stat Frame Underrun
<b>Standard</b>	Custom
<b>Origin of feature</b>	Transport layer
<b>Feature type</b>	Integer
<b>Access</b>	R
<b>Affected features</b>	Not applicable
<b>Category</b>	/StreamInformation/Statistics

Values	Description
0	Minimum
9223372036854775807	Maximum

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